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(56) Documents cited

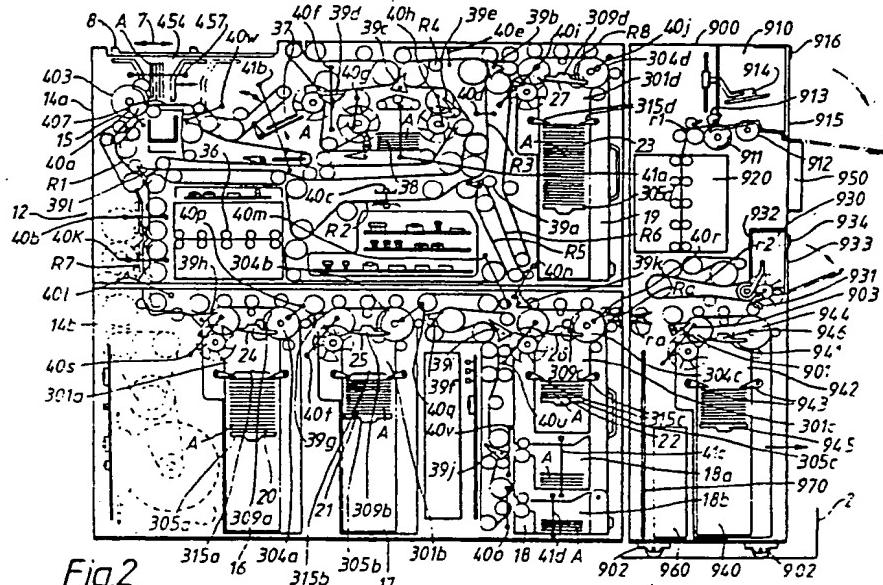
GB 2135496 A      GB 2110450 A      GB 2106687 A  
GB 2094531 A      EP 0164717 A      EP 0024704 A  
US 4602332 A

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UK CL (Edition J) G4V VAK , G4X X5  
INT CL<sup>4</sup> G07D , G07F

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(54) Automatic bank note transaction apparatus

(57) An automatic bank-note transaction apparatus comprises a main body (12) including a cabinet having a money outlet port (7) through which bank notes are dispensed, a cassette (16, 17) in the cabinet for storing the bank notes, a first conveyor in the cabinet for conveying the bank notes from the cassette to the money outlet port, and an auxiliary unit (900) adapted to the main body and having a cassette (940) for providing bank notes to the cassette in the cabinet.



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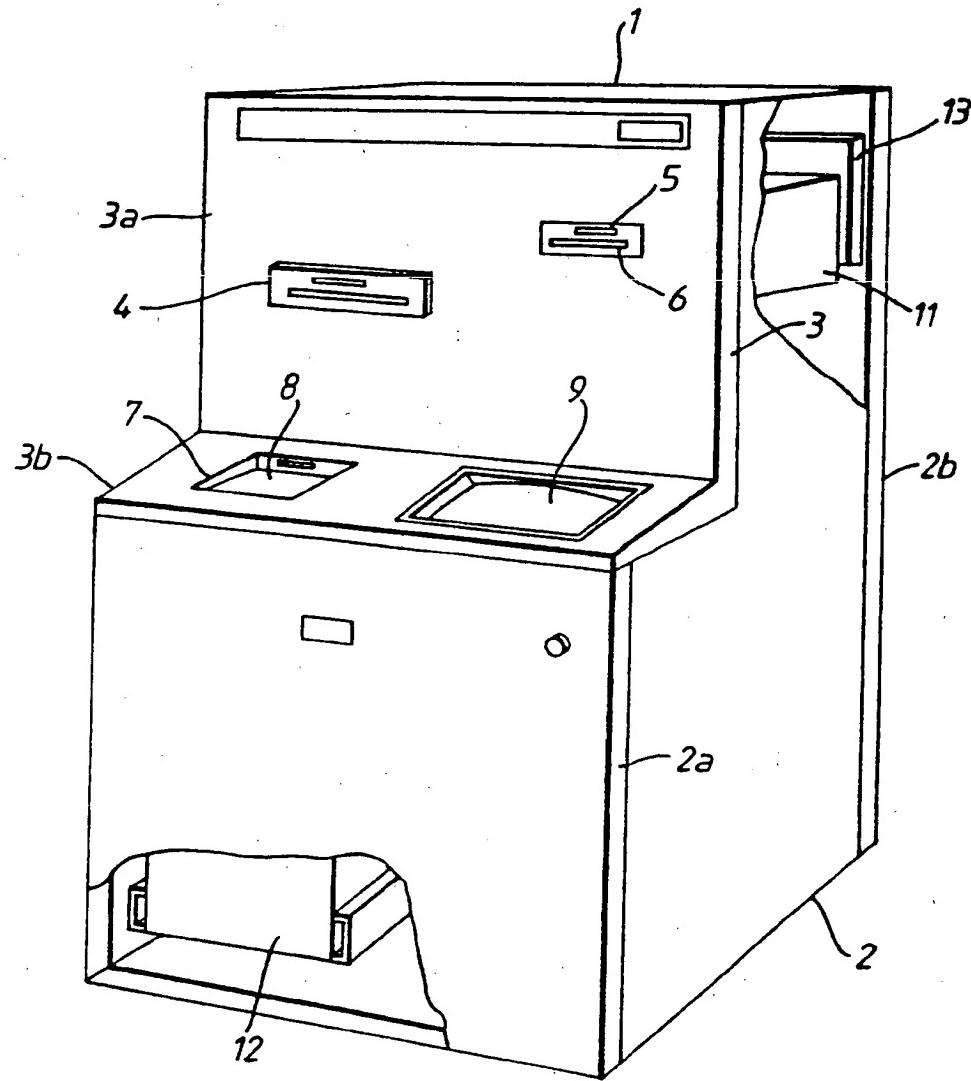
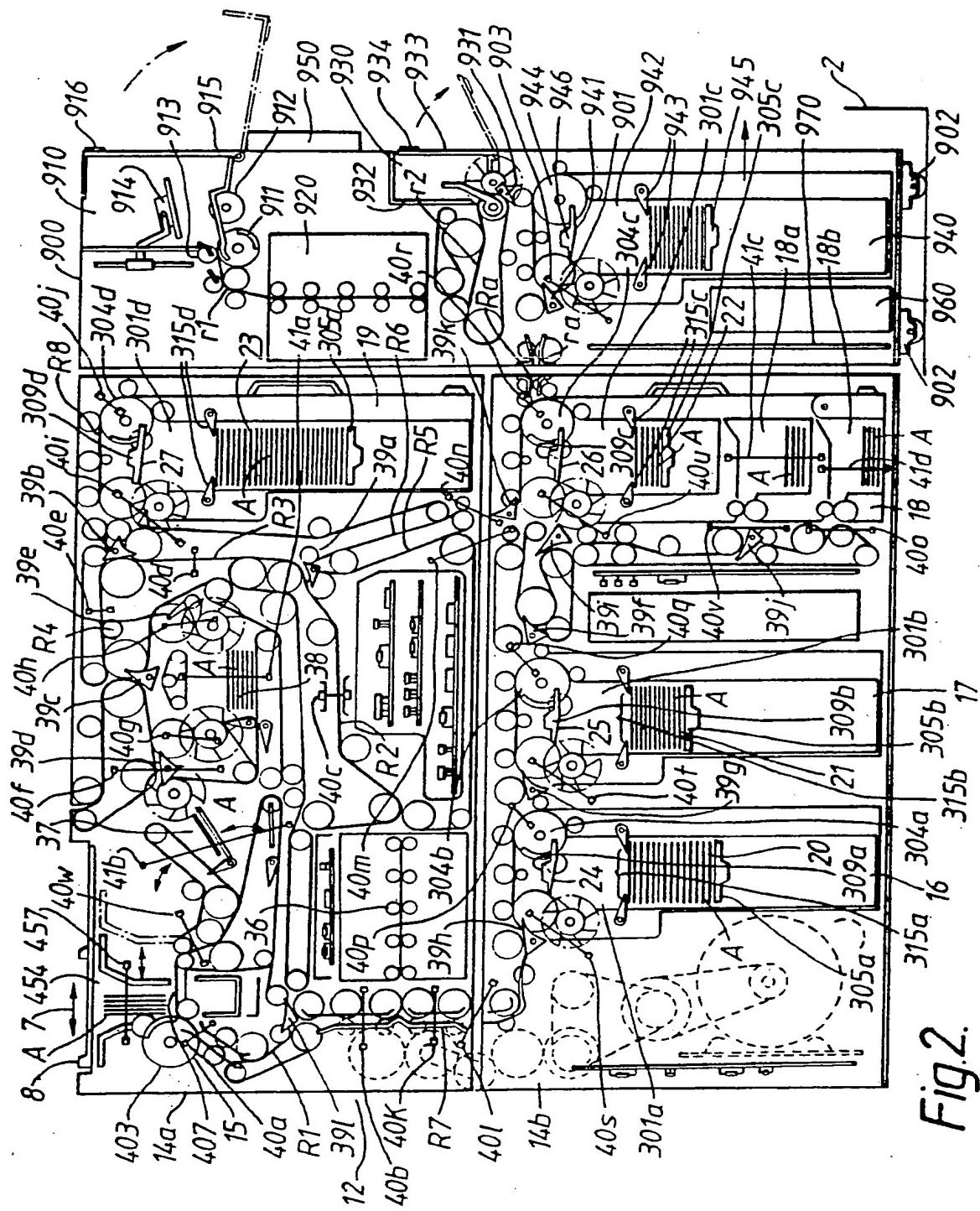


Fig. 1.

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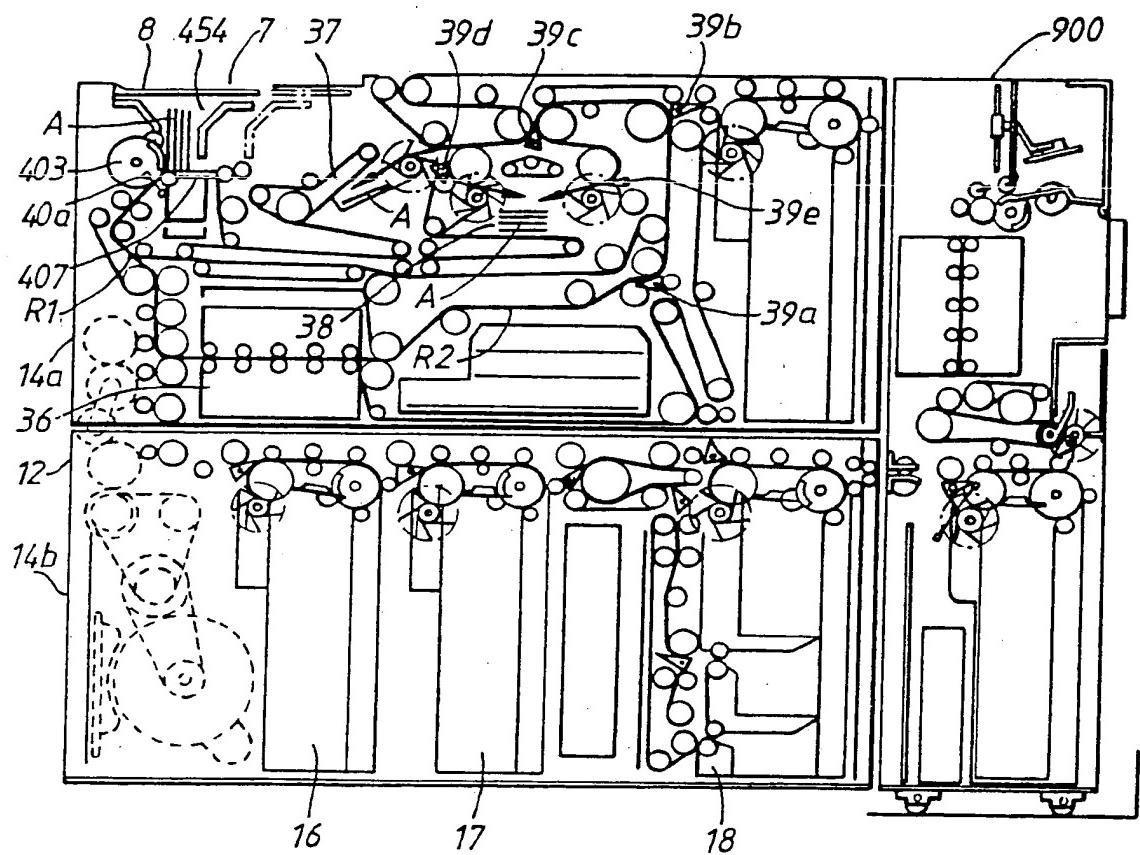


Fig. 3.

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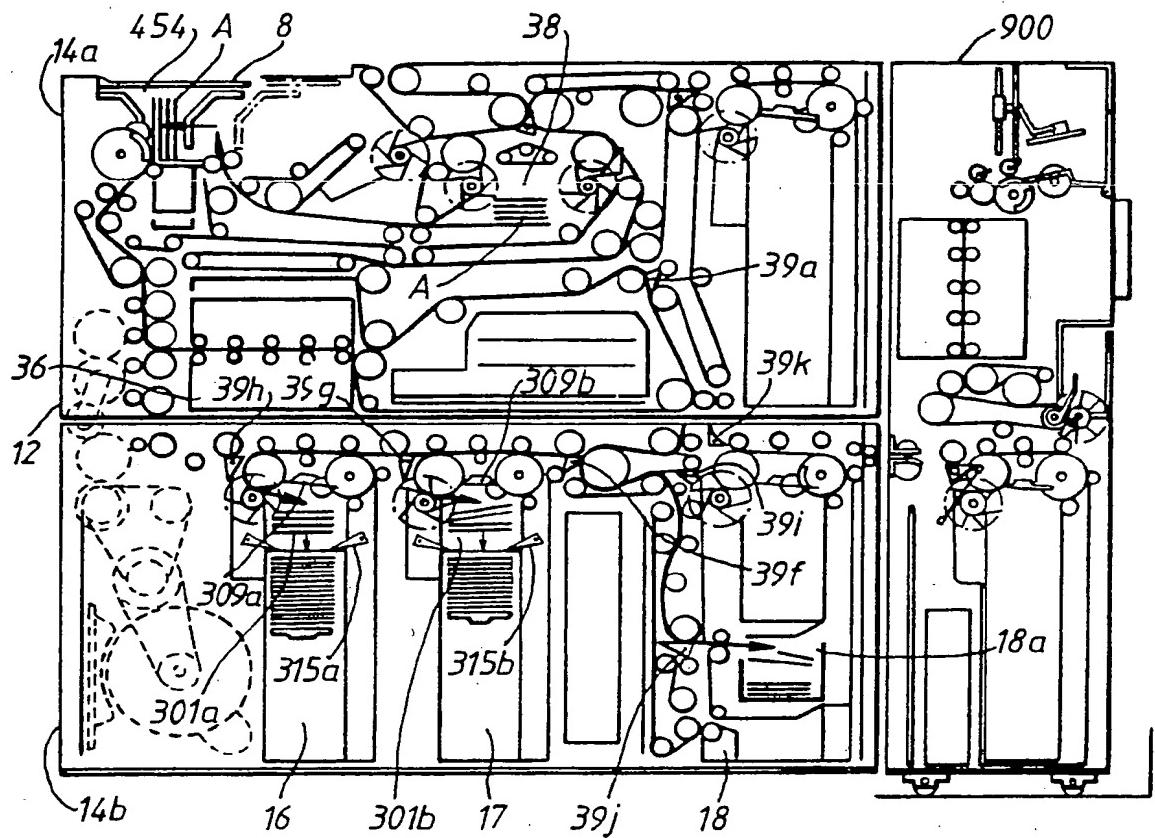


Fig.4.

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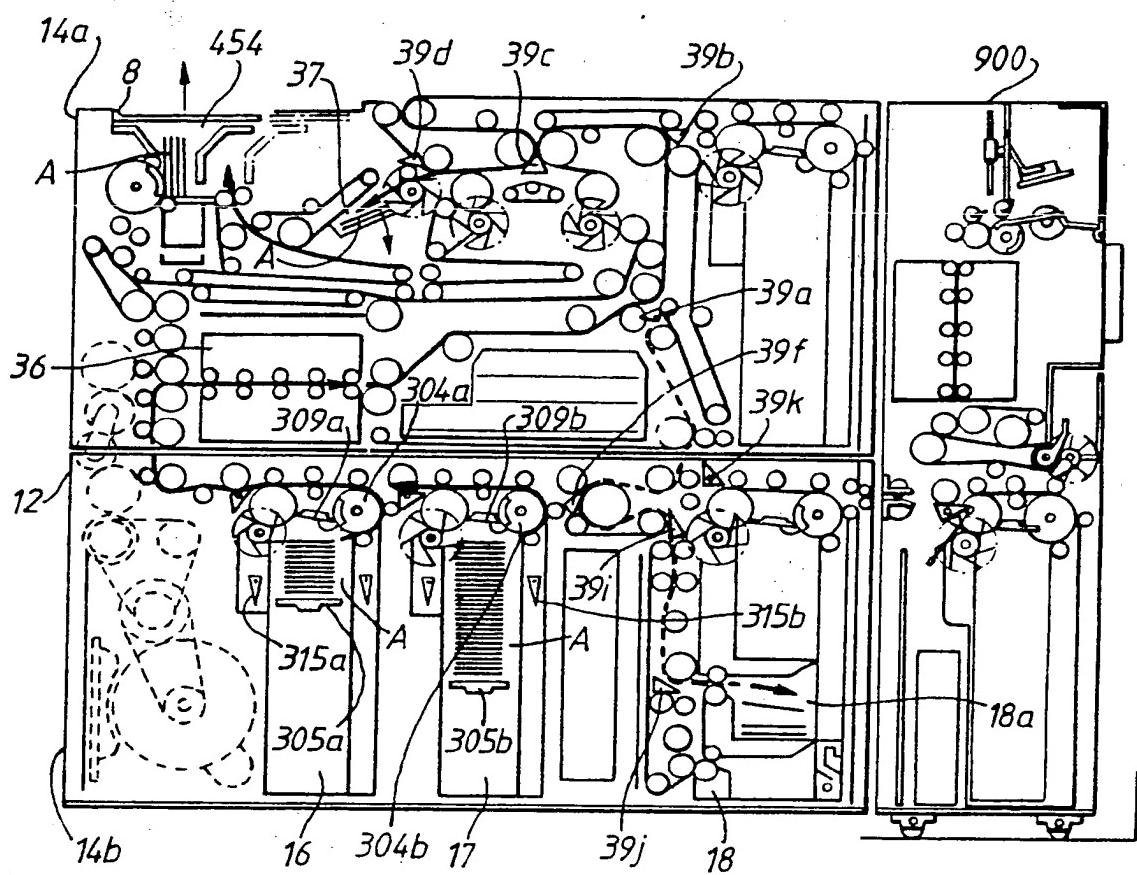


Fig.5

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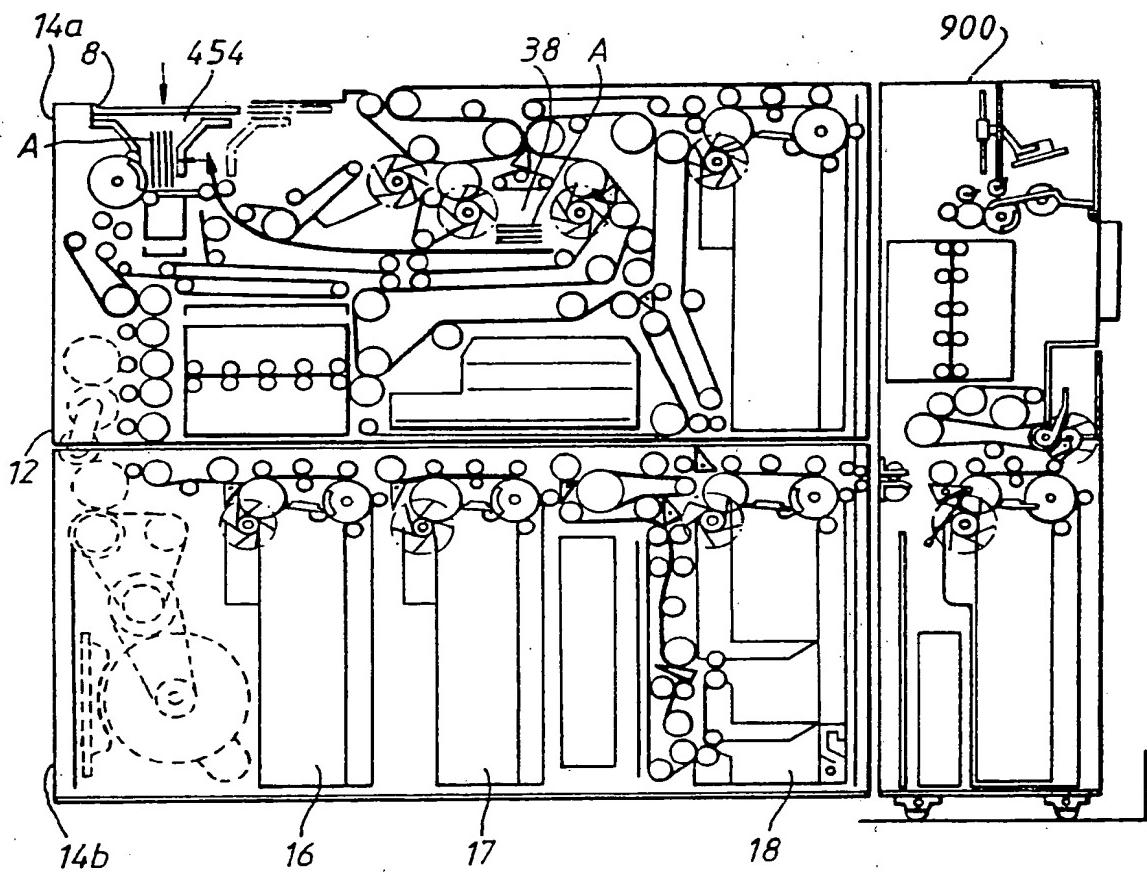


Fig.6.

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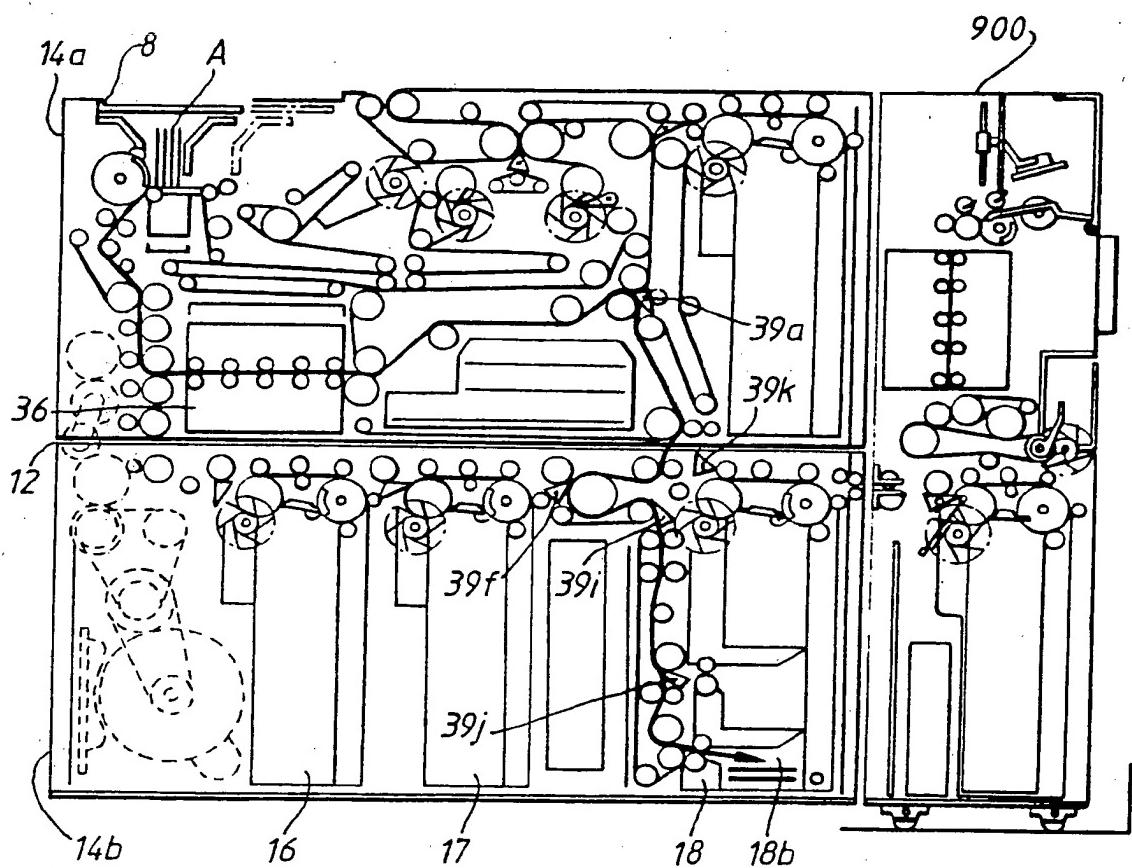


Fig.7

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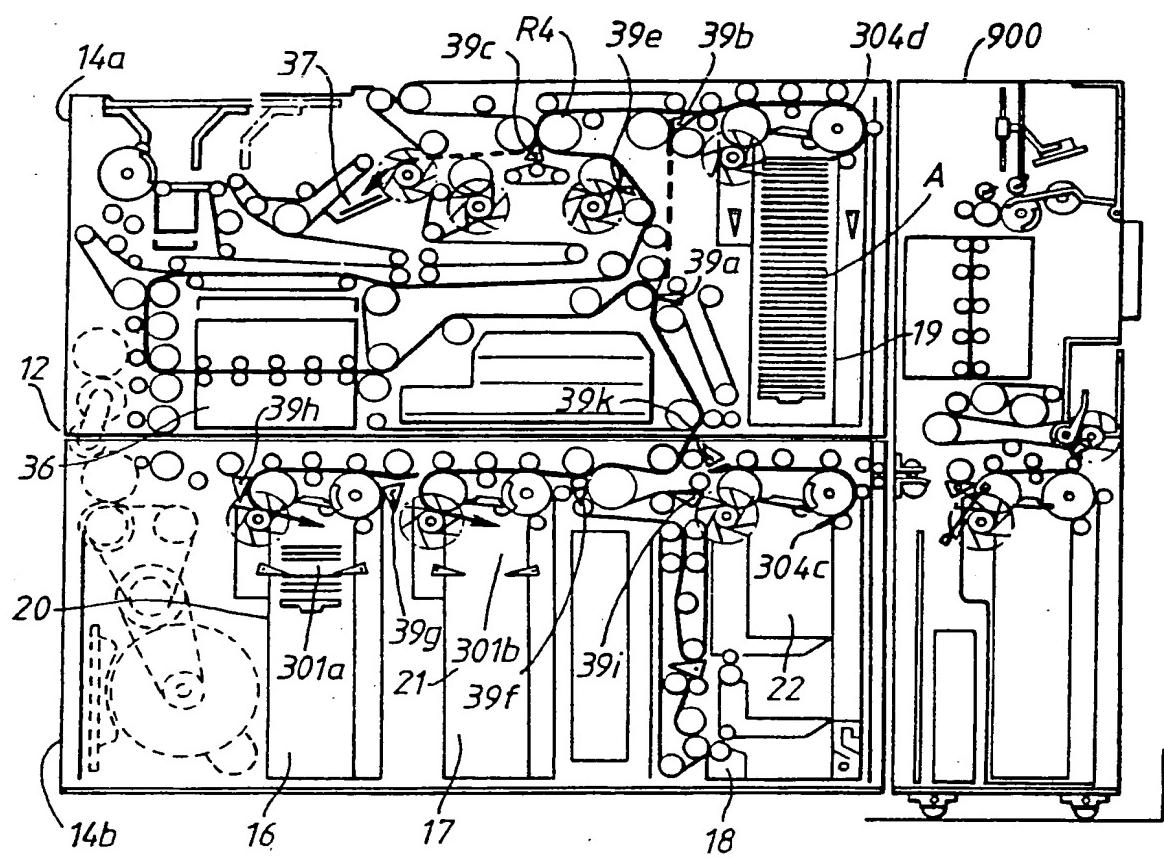


Fig.8

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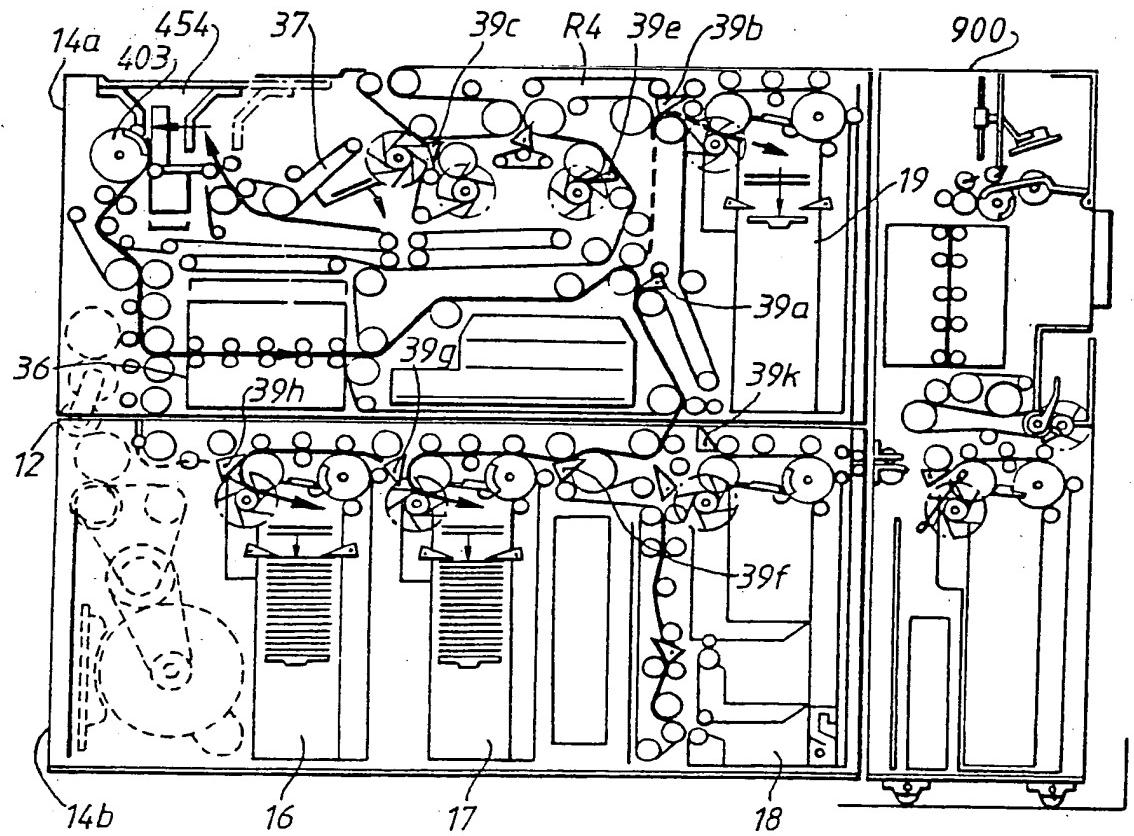


Fig 9

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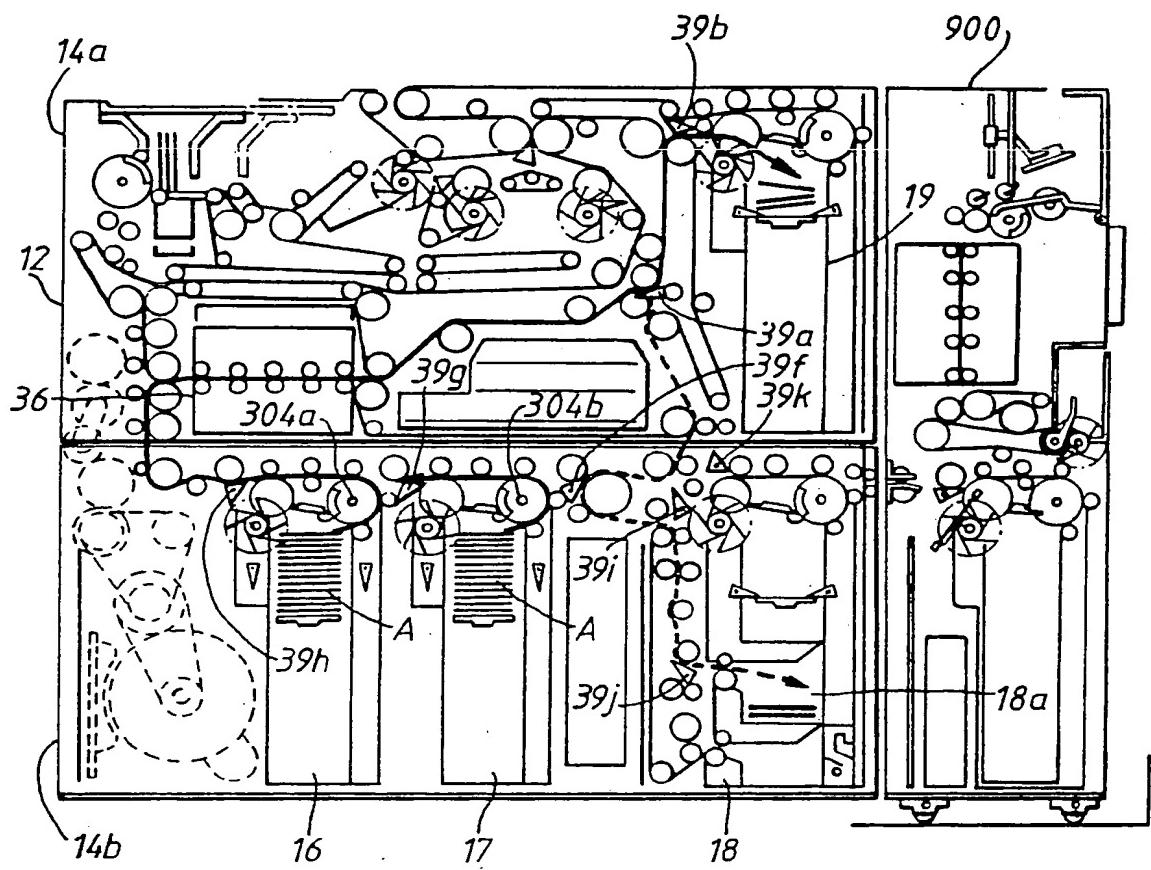


Fig. 10.

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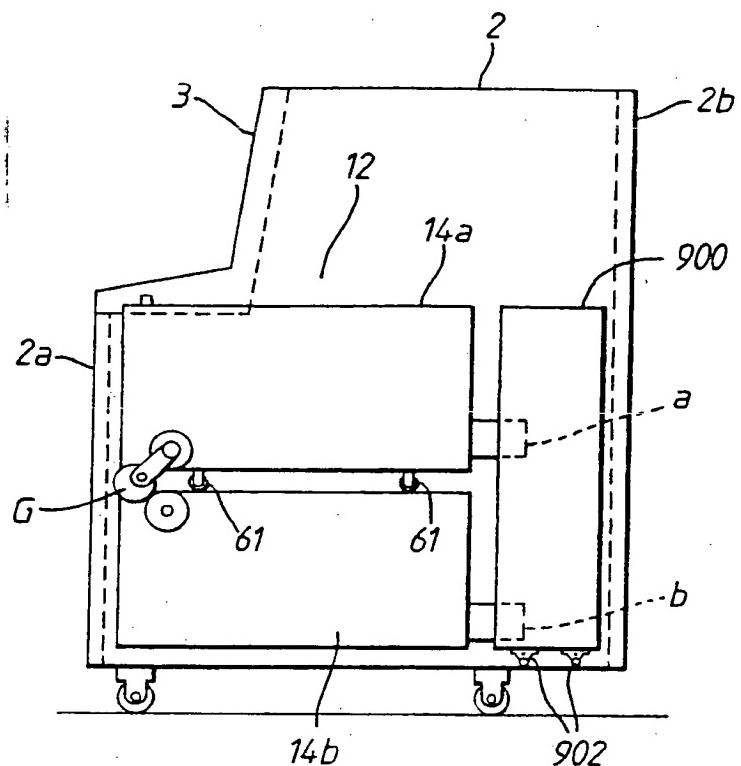


Fig. 11A

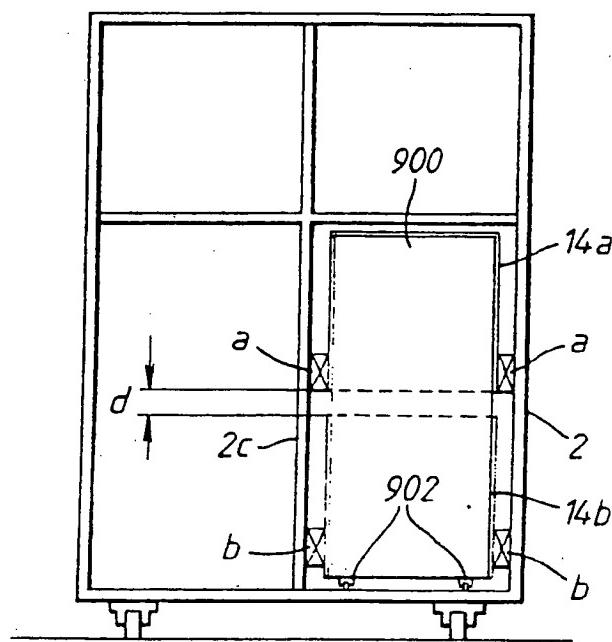


Fig. 11B

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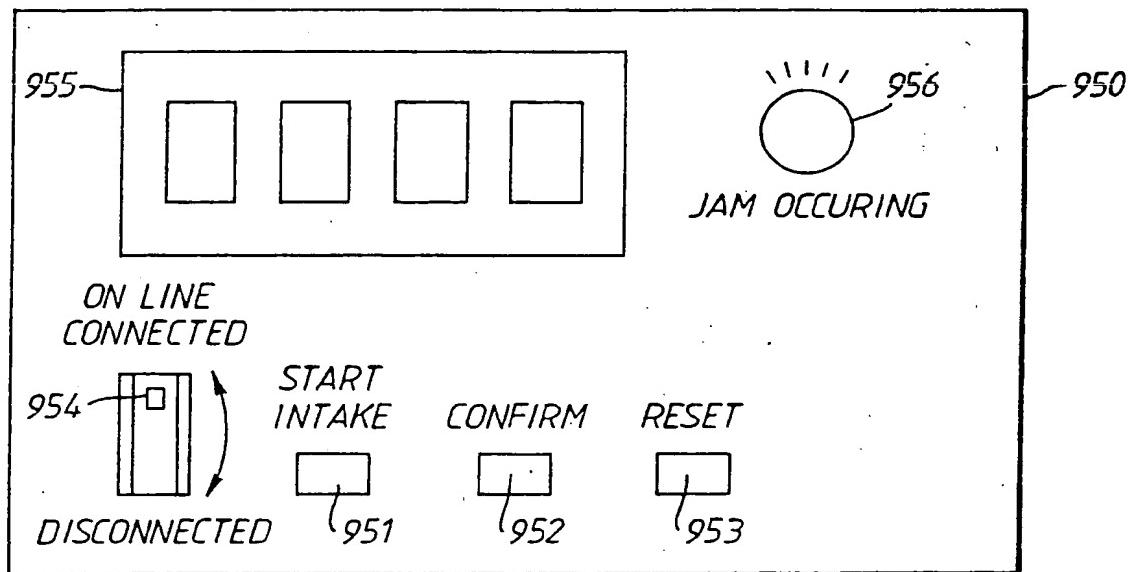


Fig. 12.

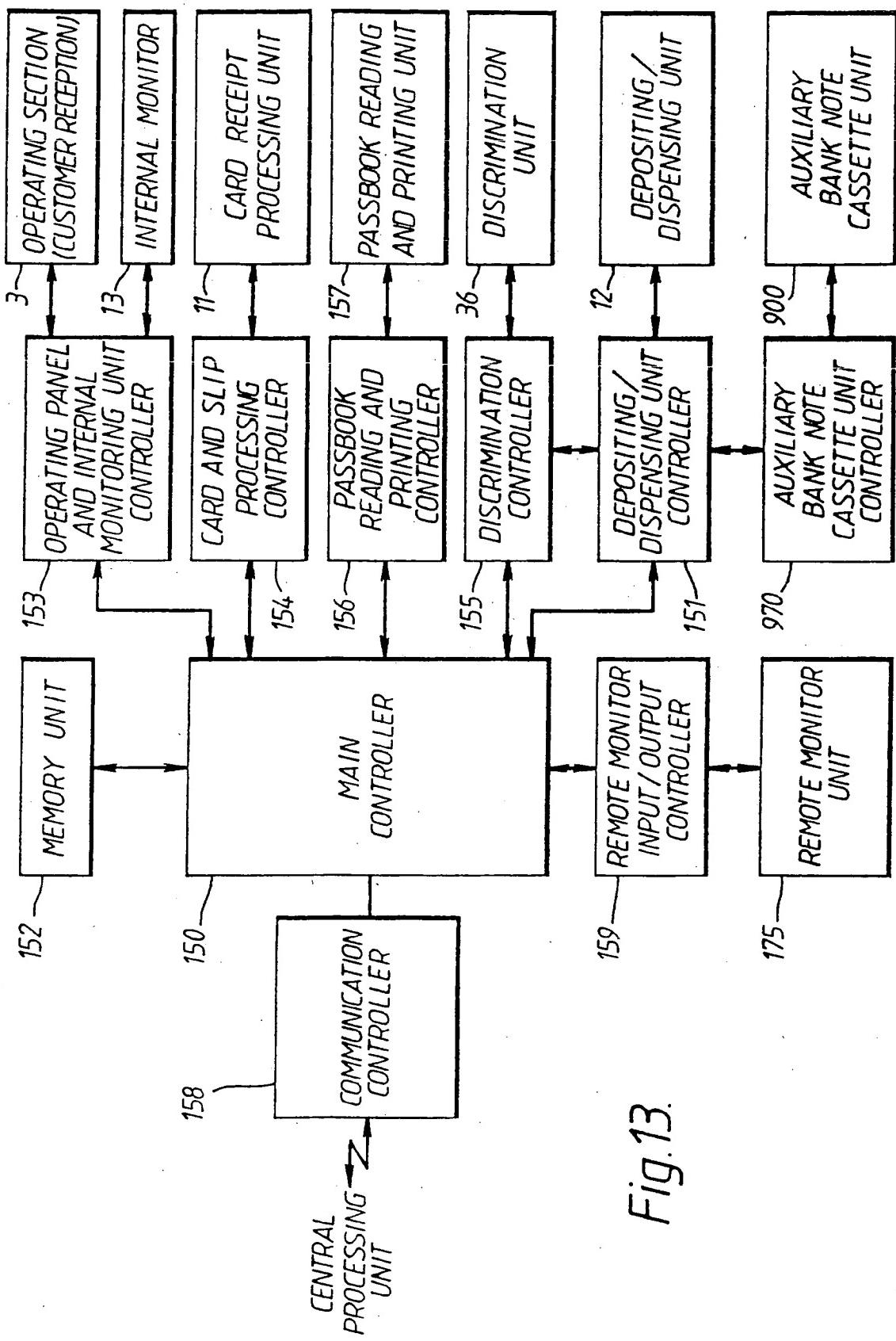
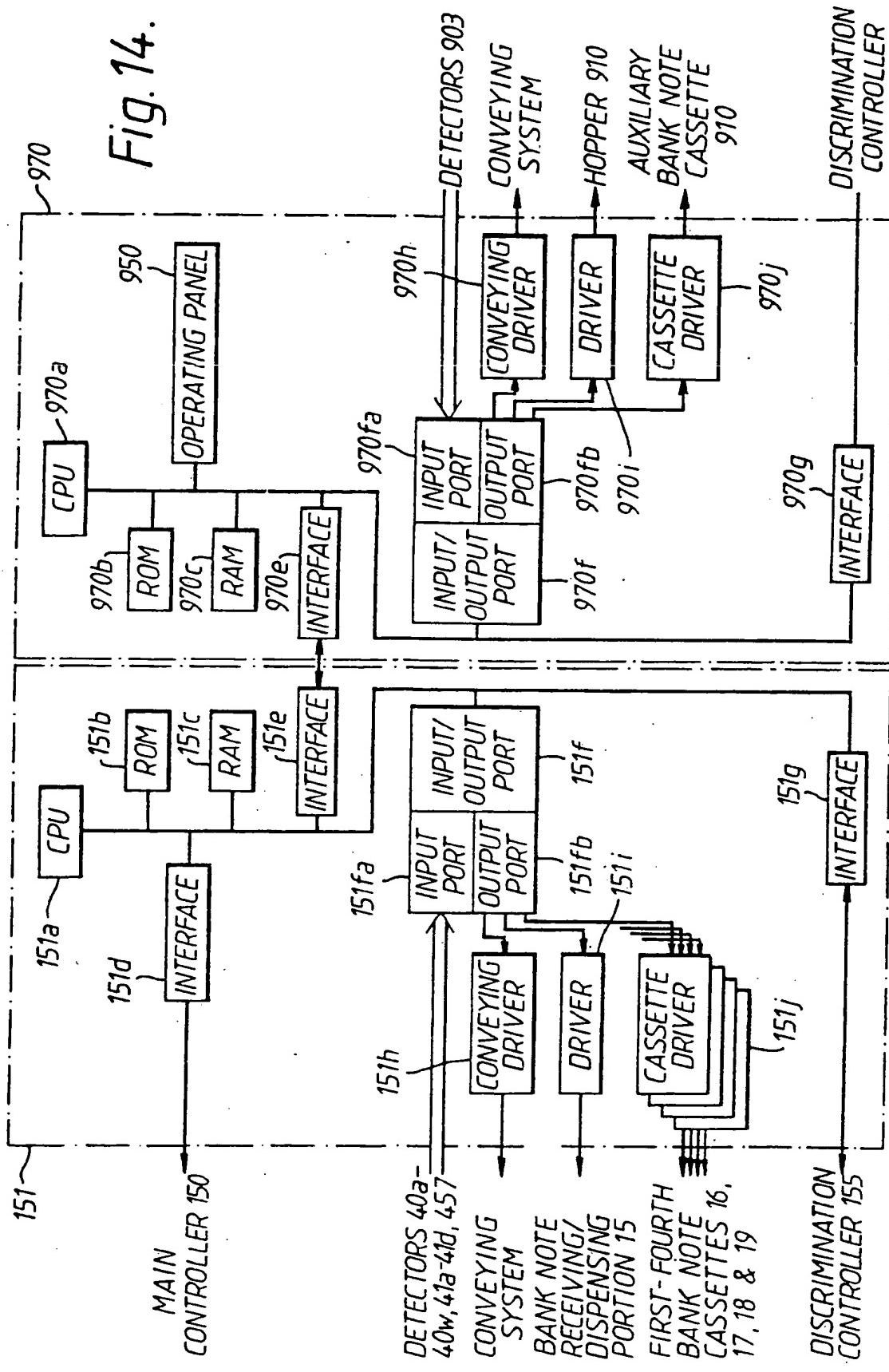


Fig.13.

Fig. 14.



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	DEPOSITING	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	A1 B1
	REPLENISHMENT	NUMBER OF 5,000 YEN NOTES	C1
	LOADING	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	D1 E1
	DISPENSING	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	F1 G1
	PARTIAL SUCKING-UP	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	H1 I1
	STRICT CHECKING	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	J1 K1
	RAM	NUMBER OF 5,000 YEN NOTES RECOVERY	L1 M1 N1
	CURRENT VALUE AREA	NUMBER OF 1,000 YEN NOTES STORED NUMBER OF 10,000 YEN NOTES STORED NUMBER OF REJECT NOTES STORED	O1 P1 Q1
	DEPOSITING / DISPENSING UNIT	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES NUMBER OF 5,000 YEN NOTES	R1 S1 T1

Fig. 15.

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RELEVANT TRANSACTION AREA	DEPOSITING	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	a1 b1
	REPLENISHMENT	NUMBER OF 5,000 YEN NOTES NUMBER OF 1,000 YEN NOTES	c1 d1
	LOADING	NUMBER OF 10,000 YEN NOTES NUMBER OF 1,000 YEN NOTES	e1 f1
	DISPENSING	NUMBER OF 10,000 YEN NOTES NUMBER OF 1,000 YEN NOTES	g1 h1
	PARTIAL RECOVERY	NUMBER OF 1,000 YEN NOTES NUMBER OF 10,000 YEN NOTES	i1 j1
	AUX. NOTE MEMORY AREA	DENOMINATIONS NUMBER OF NOTES	k1 l1
		PRIMARY NEAR END SECONDARY NEAR END	m1 n1
		NEAR END NUMBER OF 1,000 YEN NEAR END NUMBER OF 10,000 YEN	o1 p1
	SPECIFIED VALUE MEMORY AREA	NEAR END NUMBER OF 1,000 YEN MAXIMUM PAYABLE NMBR OF 1,000 YEN NUMBER OF NOTES	q1 r1 s1
		OTHER	t1

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Fig. 15 (cont.)

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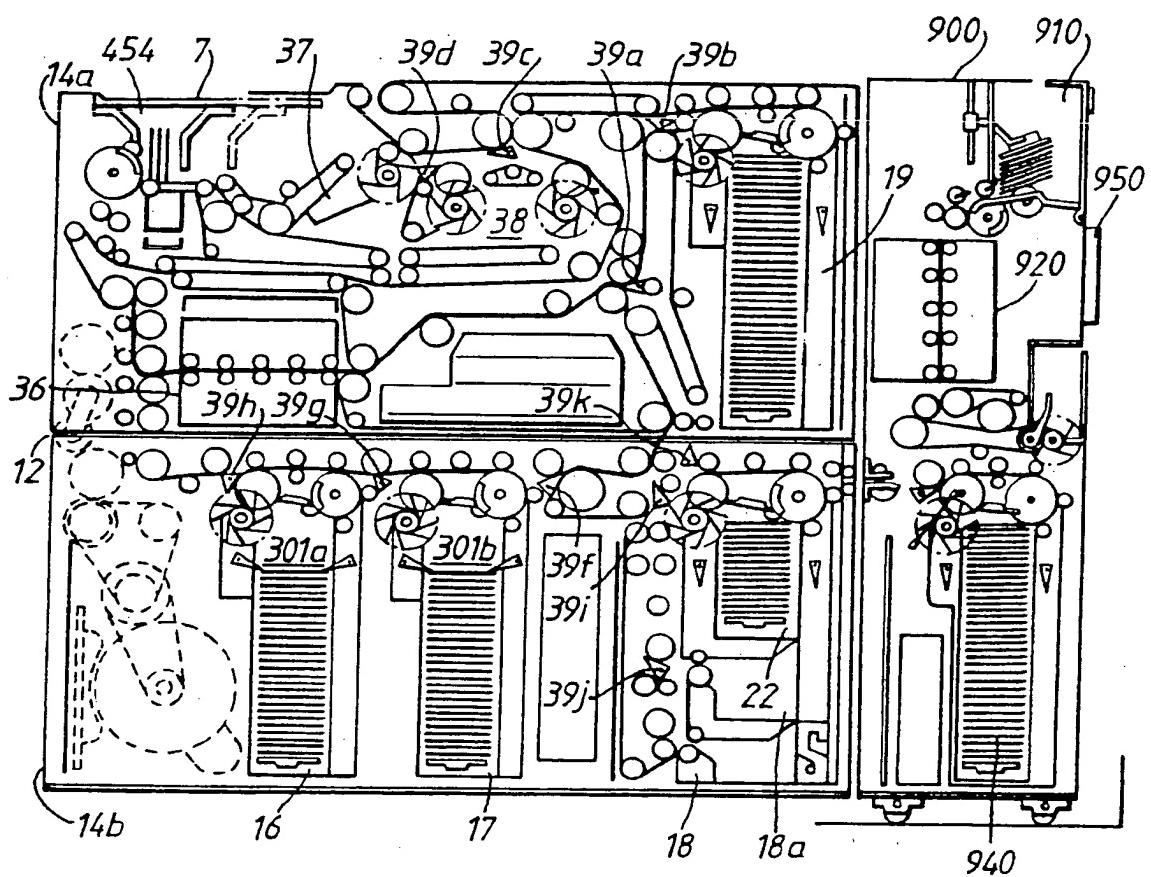


Fig. 16.

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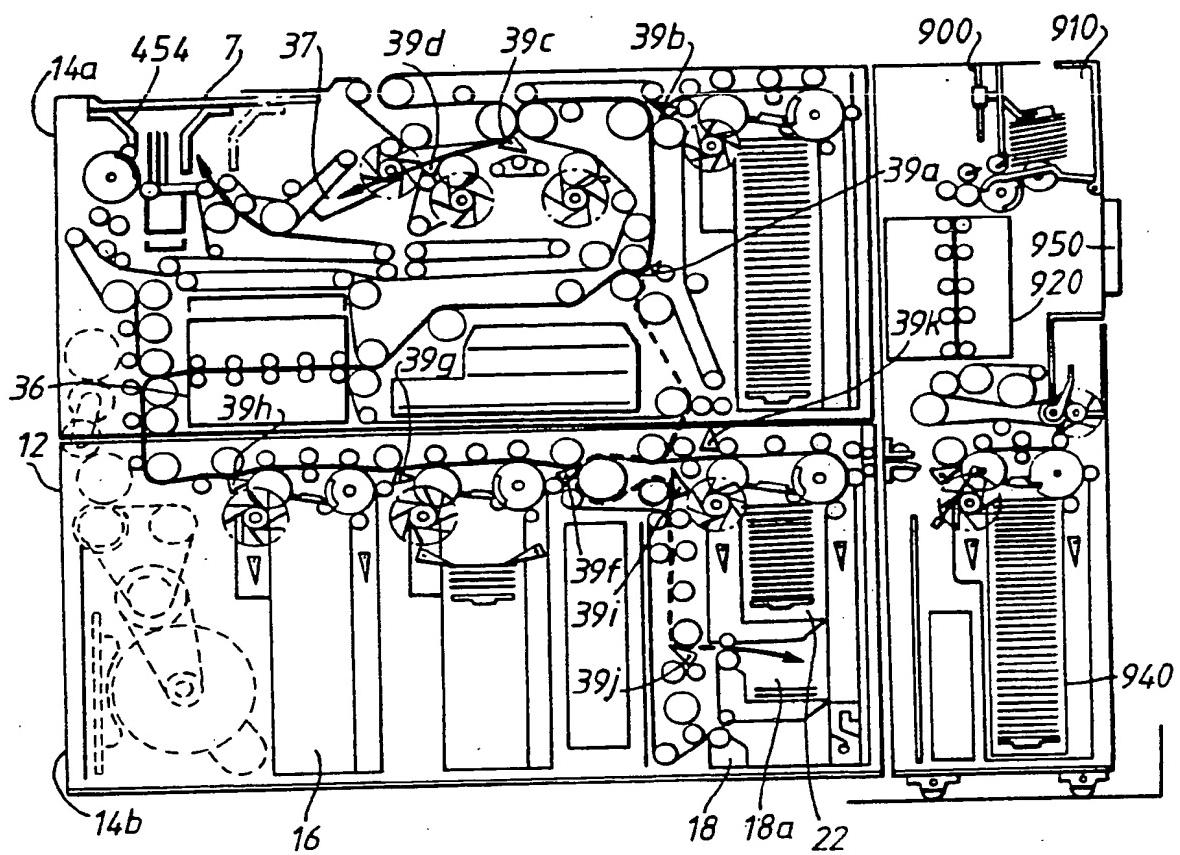
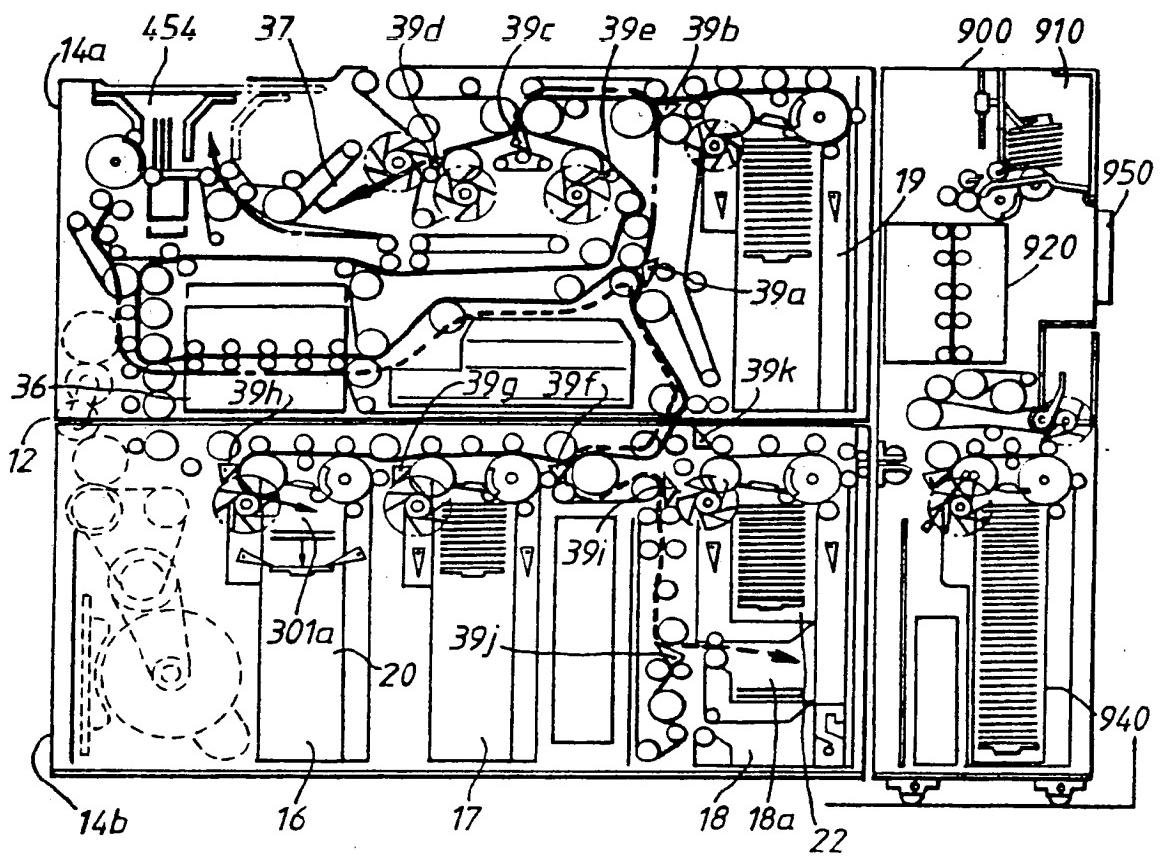


Fig.17

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*Fig. 18.*

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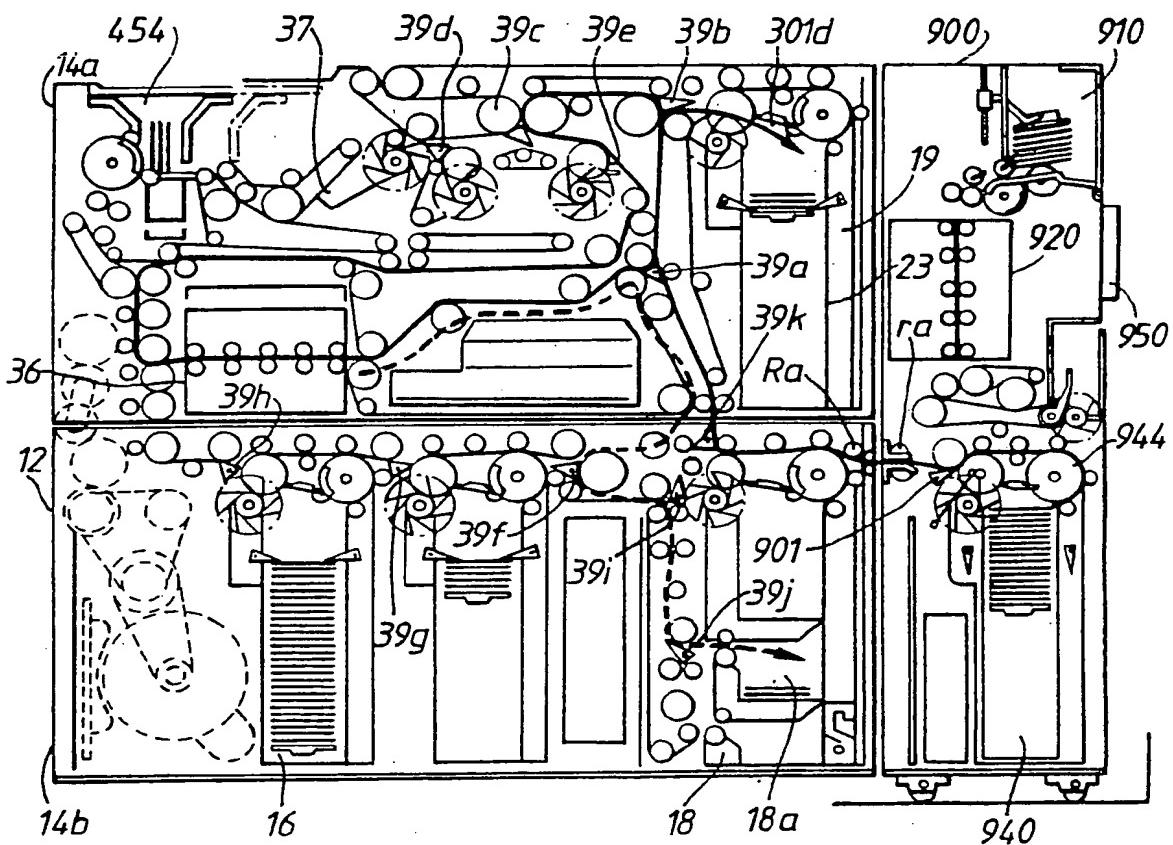


Fig. 19

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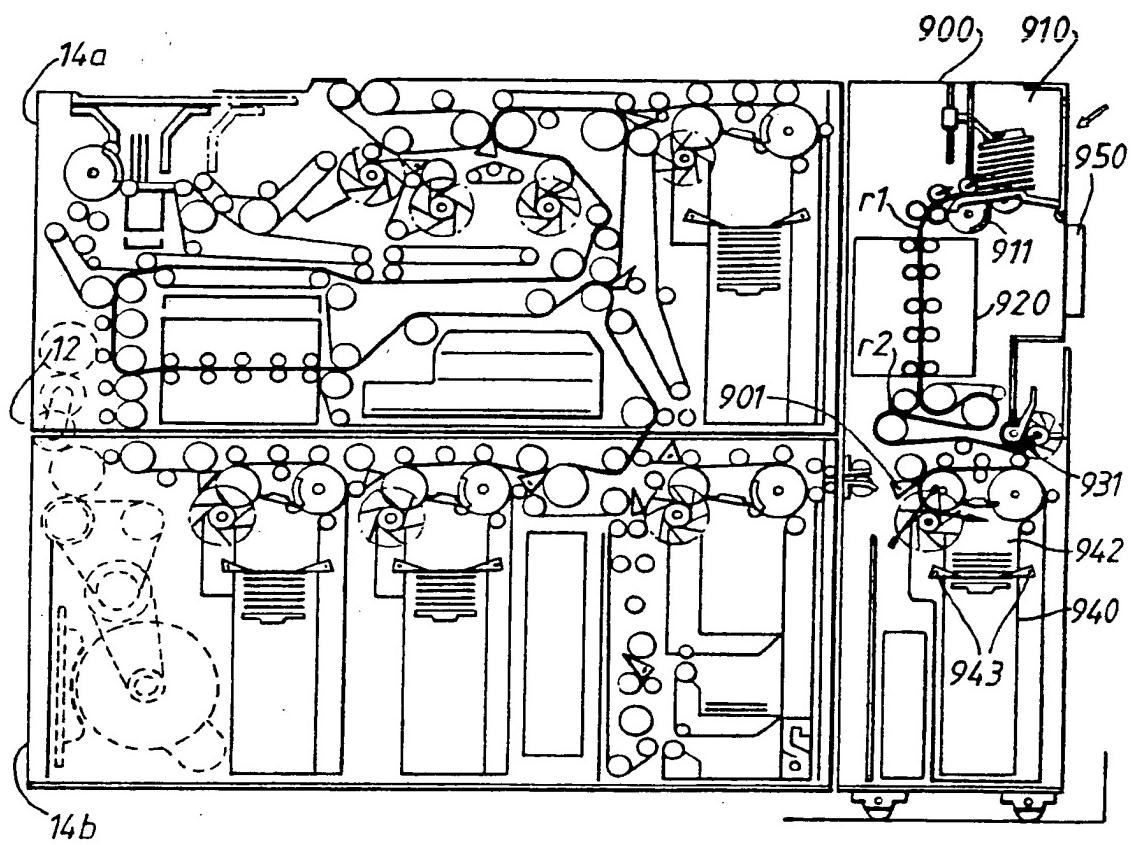
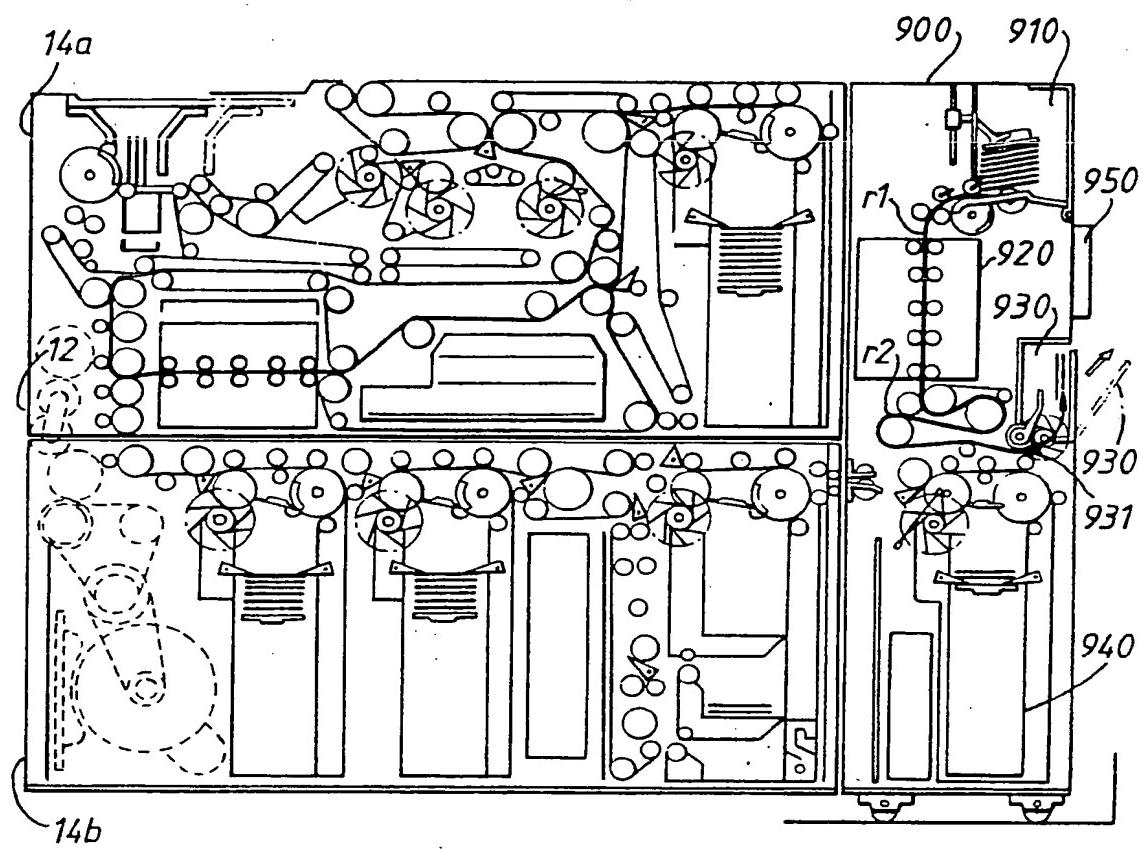


Fig.20.

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*Fig. 21.*

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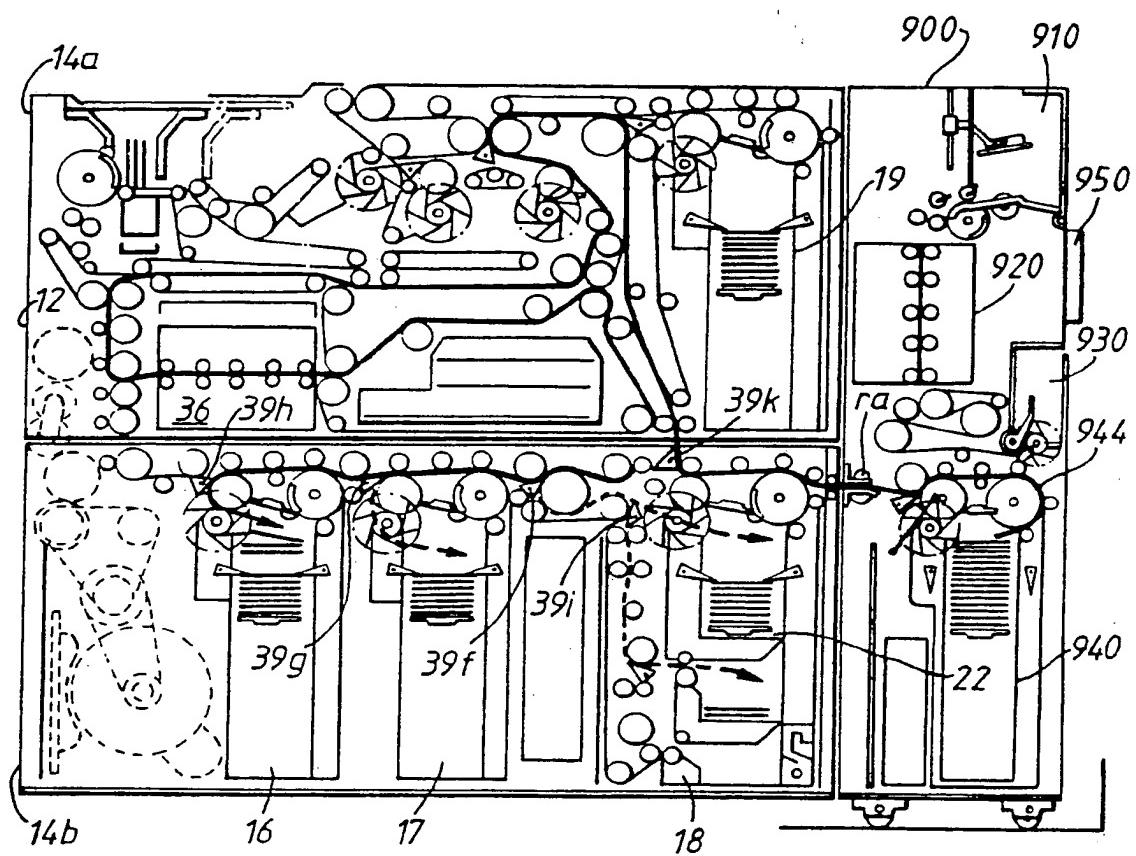


Fig.22.

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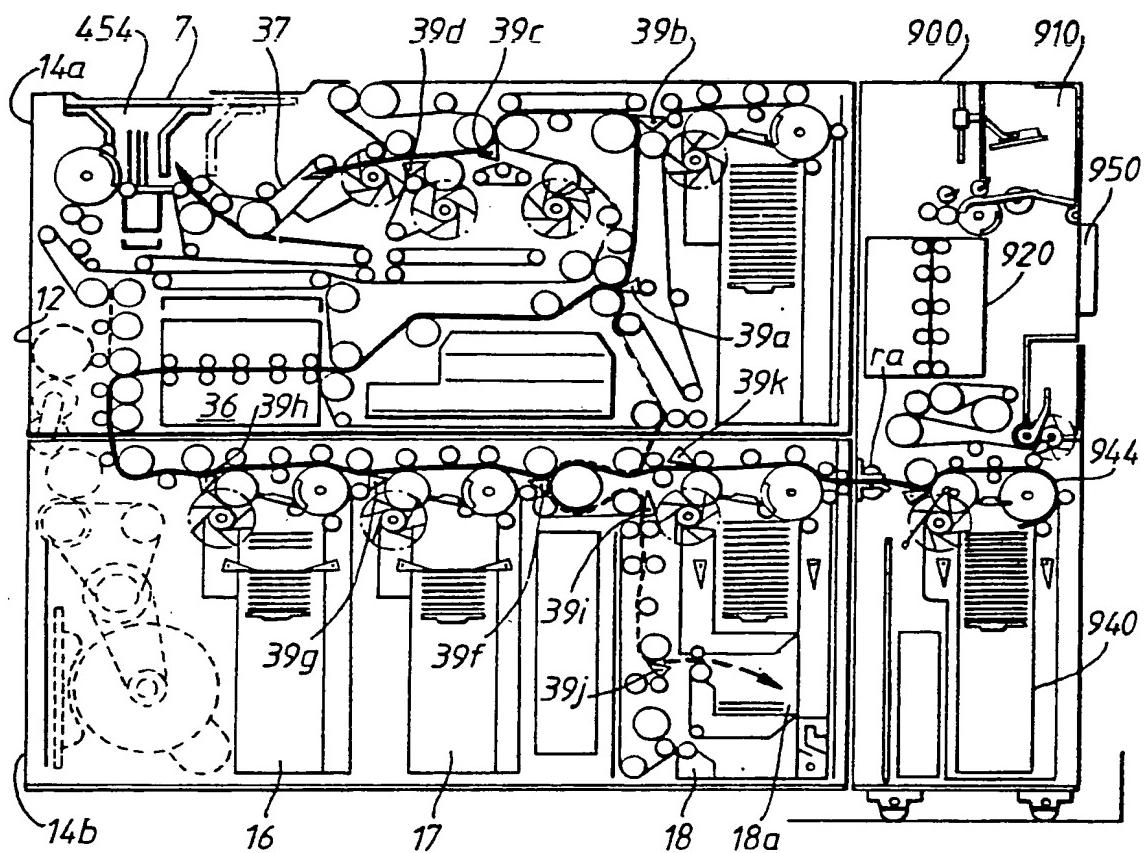


Fig. 23

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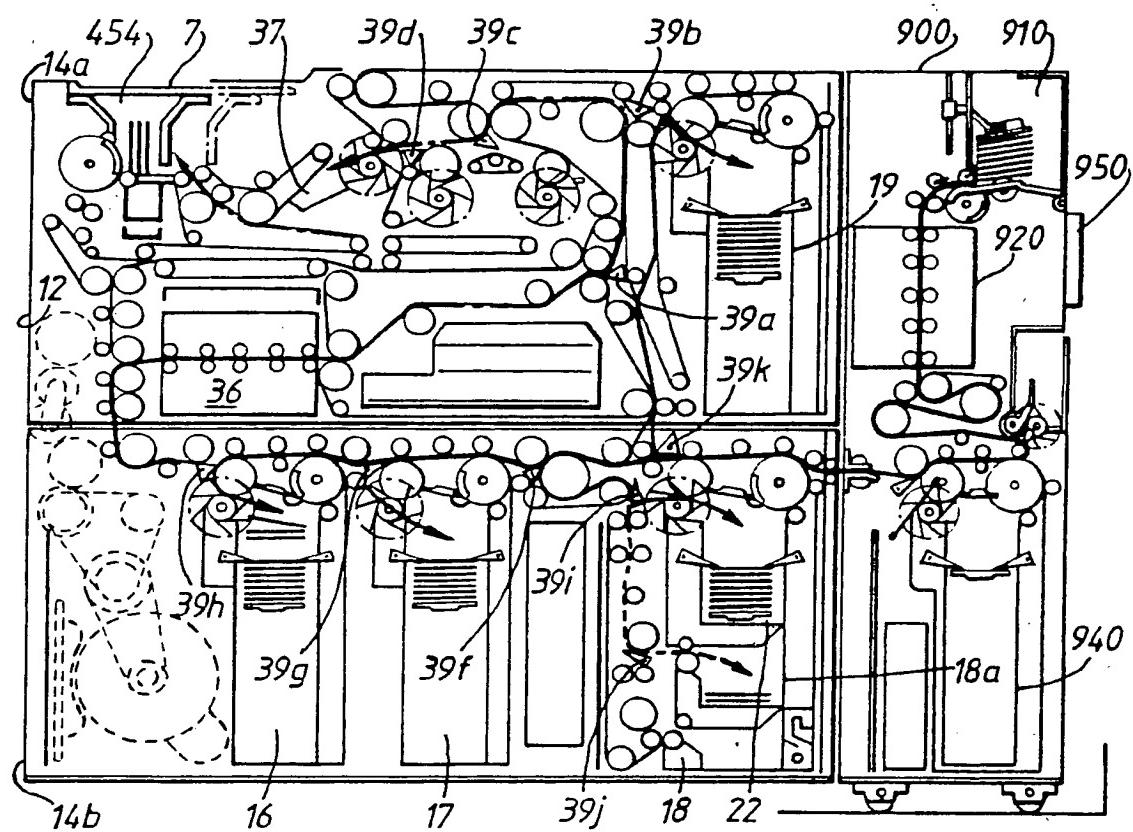


Fig. 24.

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### AUTOMATIC TRANSACTION APPARATUS

The present invention relates to an automatic transaction apparatus such as depositing/dispensing apparatus, which automatically performs the depositing/dispensing of bank notes.

In recent years, depositing/dispensing apparatus sometimes called ATM (Automatic Tellers Machine) have been installed in financial organisations such as banks. ATMs are apparatus which can be operated by the customers (users) themselves for automatic transactions such as cash withdrawals (dispenses) and deposits (receipts), using cards or passbooks. They operate for extended times, even after normal close of business of financial organisations, and they are used for unmanned operation when situated in department stores or in railway stations or airports.

Increasing the efficiency of the depositing/dispensing apparatus, has become an important project for financial organisations such as banks. In order to increase the efficiency of ATMs, a bank note automatic circulating type (recycling type) depositing/dispensing apparatus has been developed which uses bank notes which have been deposited in it for subsequent dispensing.

However, when the above type of depositing/dispensing apparatus are operated unmanned for long periods, the bank notes available for dispensing are not replenished. For this reason, there is the disadvantage

that the depositing/dispensing apparatus becomes incapable of continuous operation.

It is an object of the present invention to provide an automatic transaction apparatus in which the problem of insufficiency of bank notes for dispensing is at least partly overcome.

According to the present invention an automatic transaction apparatus comprising:

a main body including a cabinet having an outlet port through which bank notes are dispensed;

means in the cabinet for storing bank notes;

first conveying means in the cabinet for conveying bank notes from the storing means to the outlet port;

second conveying means in the cabinet for conveying bank notes to the storing means; and an

auxiliary unit adapted for use with the main body and including means operatively connectable to the second conveying means for supplying bank notes to the second conveying means.

In order that the invention may be more readily understood it will now be described, by way of example only, with reference to the accompanying drawings in which;

FIGURE 1 is a partially cutaway perspective view showing the depositing/dispensing apparatus as an automatic transaction apparatus of the present invention;

FIGURE 2 is a sectional view showing the construction of the depositing/dispensing unit and the auxiliary bank note cassette unit of the present invention;

FIGURES 3 and 4 are sectional views showing the depositing operation of the depositing/dispensing unit;

FIGURE 5 is a sectional view showing the dispensing operation of the depositing/dispensing unit;

FIGURE 6 is a sectional view showing the deposit returning operation of the depositing/dispensing unit;

FIGURE 7 is a sectional view showing the forgotten notes recovery operation of the depositing/dispensing unit;

FIGURES 8 and 9 are sectional views showing the loading operation of the bank notes of the depositing/dispensing unit;

FIGURE 10 is a sectional view showing the strict

checking operation of the depositing/dispensing unit;

FIGURE 11A is a side view showing the state of installation of the depositing/dispensing unit and the auxiliary bank note cassette unit;

FIGURE 11B is a rear view showing the state of installation of the depositing/dispensing unit and the auxiliary bank note cassette unit;

FIGURE 12 is a front view showing the operating panel of the auxiliary bank note cassette unit;

FIGURE 13 is a block diagram showing a control system of an automatic transaction apparatus of the present invention;

FIGURE 14 is a block diagram showing the composition of a depositing/dispensing unit controller and an auxiliary bank note cassette unit controller in the automatic transaction apparatus shown in FIGURE 13;

FIGURE 15 is a map showing an example of the composition of the memory area in the RAM of the depositing/dispensing unit controller;

FIGURE 16 is a sectional view showing a depositing/dispensing unit being operated on a holiday;

FIGURE 17 is a sectional view showing a dispensing operation from a third bank note cassette during holiday operation;

FIGURE 18 is a sectional view showing the replenishment operation of bank notes to a first bank note cassette from a fourth bank note cassette;

FIGURE 19 is a sectional view showing the replenishment operation of bank notes from an auxiliary bank note cassette to the fourth bank note cassette;

FIGURE 20 is a sectional view showing the replenishment operation of bank notes from the hopper to the auxiliary bank note cassette;

FIGURE 21 is a sectional view showing the reject processing in the replenishment operation of bank notes from the hopper to the auxiliary bank note cassette;

FIGURE 22 is a sectional view showing the replenishment operation of bank notes from the auxiliary bank note cassette to each of the first to fourth bank note cassettes;

FIGURE 23 is a sectional view showing the dispensing operation of bank notes from the auxiliary bank note cassette; and

FIGURE 24 is a sectional view showing the replenishment operation of bank notes from the hopper to each of the first to fourth bank note cassettes, and the dispensing operation from the hopper.

Referring to Fig. 1, depositing/dispensing apparatus 1 is equipped with L-shaped operating section 3 on the front of cabinet 2. Passbook insertion port 4, card insertion port 5 and receipt dispensing port 6 are arranged in vertical portion 3a of operating section 3.

A money inlet/outlet port 7, which combines a

receipt port and a dispensing port is provided in horizontal portion 3b of operating section 3, and door 8 which is free to open and close is provided in money inlet/outlet port 7. Moreover, CRT display unit 9 which houses a touch sensor is provided in horizontal portion 3b. This guides the user by displaying operating procedures and other information such as illustrations, characters and phrases, and at the same time, so-called input operations can be performed by pressing portions of the display corresponding to passcode number, value, account number and confirmation or cancellation of the transaction.

Also, a passbook reader and printer (not illustrated), which receives a passbook inserted from passbook insertion port 4 and executes the reading and recording of its magnetic information and, at the same time, prints the details of the transaction, and card/receipt processing unit 11, which handles a magnetic card inserted from card insertion port 5 and which executes the issuing of a slip to receipt dispensing port 6 and the production of a duplicate journal, are provided inside cabinet 2. Furthermore, inside cabinet 2, are housed depositing/dispensing unit (a main body of the transaction apparatus) 12 which is provided with such functions as depositing/dispensing of bank notes, recovery of forgotten bank notes, loading and checking, and internal monitor 13.

FIGURE 2 shows the construction of depositing/dispensing unit 12. Reference numeral 14a denotes the upper unit of depositing/dispensing unit 12 and 14b is the lower unit. Also, 900 denotes an auxiliary bank note cassette unit as an option (additional unit) to

depositing/dispensing unit 12. Auxiliary unit 900 is described later.

In FIGURE 2, bank note receiving/dispensing portion 15 is provided facing money inlet/outlet port 7 in the front (the direction facing the customer) upper part inside upper unit 14a. This bank note receiving/dispensing portion 15 is composed of intake roller 403, floor 407 and bank note receiving chamber 454. Also, in the rear of upper unit 14a, fourth bank note cassette 19 is provided as a loading cassette, and forms loading bank note stacker 23.

Inside lower unit 14b, first bank note cassette 16 as a 10,000 yen note cassette, for example, and second bank note cassette 17 as a 1,000 yen note cassette, for example, are arranged and respectively form bank note stackers 20 and 21. At the same time, third bank note cassette 18 is provided as a depositing note cassette which stores bank notes unsuitable for dispensing, such as 5,000 yen notes, for example, rejected notes and recovered notes, and forms bank note stacker 22, stacking section 18a and recovery box 18b. Also, in each of the above bank note cassettes 16, 17, 18 and 19, first, second, third and fourth accumulator/extractor devices 24, 25, 26 and 27 are respectively provided. At the same time, flappers 315a, 315b, 315c and 315d are respectively provided to form stacking sections 301a, 301b, 301c and 301d as spaces which can accumulate, for instance, 100 bank notes each. Accumulator/extractor devices 24, 25, 26 and 27 are composed of respective take out rollers 304a, 304b, 304c and 304d, elevators 305a, 305b, 305c and 305d and presser plates 309a, 309b, 309c and 309d.

Also, discrimination unit 36 is provided in the front end, and approximately centrally in the vertical direction, inside upper unit 14a, and dispensing temporary stacking section 37 and depositing temporary stacking section 38 are provided to its right.

Bank note convey paths R (R1-R8) are formed inside units 14a and 14b, and are designed to be able to transport bank notes A to every part. At the same time, first to twelfth selector gates 39a-39l which use rotary solenoids (not shown) as drive sources, are provided at the branch points of convey paths R. Furthermore, the design is that bank note passage detectors 40a-40w are arranged at various positions along bank note convey paths R, and also bank note presence detectors (remainder check sensors) 41a-41d and 457 are arranged at each stacking section where bank notes A are stacked. Bank note passage detectors 40a-40w and bank note presence detectors 41a-41d and 457 are all of well-known design, composed of light-emitting elements and light-receiving elements.

Also, first convey path Ra, which enables the transport of bank notes from auxiliary bank note cassette unit 900 to the inside of depositing/dispensing unit 12, is opened in the back of lower unit 14b.

The operation (the flow of bank notes) of the above type of construction will now be described.

FIGURES 3 and 4 show the flow of bank notes in the depositing operation.

When the display sector corresponding to the deposit operation on CRT display unit 9 is pressed by a user, door 8 of money inlet/outlet port 7 opens. In this state, the user

inserts bank notes A in a bundle of mixed denominations with fronts and backs uppermost, and in a vertical state, into bank note receiving chamber 454. Door 8 is then closed. When it is detected that door 8 is closed, floor 407 vibrates vertically and arranges bank notes A. Then intake roller 403 rotates and takes the bank notes in, one by one, from the leading edge end. As shown in FIGURE 3, bank notes A which have been taken in by intake roller 403 are transported via first convey path R1, and the number of bank notes taken in is counted by bank note passage detector 40a.

Also, bank notes A are guided to discrimination unit 36. Here, the denominations of bank notes A (note type), their genuineness and their fronts and backs are discriminated. Then they are transported via convey path R2. Bank notes A discriminated by discrimination unit 36 as having fronts uppermost are transported upwards via first selector gate 39a, thence via second and third selector gates 39b and 39c, and then their path is changed at fourth selector gate 39d and they are stacked in depositing temporary stacking section 38.

Bank notes A discriminated as having backs uppermost are transported via first and second selector gates 39a and 39b, and their path is changed at third selector gate 39c. Their path is again changed at fifth selector gate 38e and they are reversed and stacked in depositing temporary stacking section 38. By this means, bank notes A with all their backs and fronts lined up are stacked in stacking section 38.

When bank notes A are discriminated by discrimination unit 36 as being notes which should be rejected (counterfeit

notes and undiscriminatable notes), they (the reject notes) are sent to dispensing temporary stacking section 37 via first, second, third and fourth selector gates 39a, 39b, 39c and 39d, and are stacked there. The reject notes A stacked in dispensing temporary stacking section 37 are dispensed as they are to bank note receiving chamber 454 when bank notes A in bank note receiving chamber 454 have been exhausted. Then door 8 is opened and they are returned to the user.

As shown in FIGURE 4, bank notes A which are stacked in depositing temporary stacking section 38 are transported to bank note receiving chamber 454 as they stand by the user inputting confirmation from, for instance, CRT display unit 9, and then they again undergo intake transportation. After bank notes A which have been taken in again have been discriminated by discrimination unit 36, their convey path is altered downwards by first selector gate 39a and they are transported to lower unit 14b.

10,000 yen notes which have been discriminated in discrimination unit 36 are transported horizontally via eleventh, sixth and seventh selector gates 39k, 39f, and 39g. Then their path is changed by eighth selector gate 39h, and they are stacked in stacking section 301a of first bank note cassette (10,000 yen note cassette) 16.

For 1,000 yen notes, the path is changed at seventh selector gate 39g, and they are stacked in stacking section 301b of second bank note cassette (1,000 yen note cassette) 17.

For 10,000 yen and 1,000 yen notes of the old type, 5,000 yen notes and reject notes, the path is changed at sixth selector gate 39f, and they are stacked in stacking

section 18a of third bank note cassette (depositing note cassette) 18 via ninth and tenth selector gates 39i and 39j.

When all bank notes A are stacked in stacking sections 301a, 301b and 18a of first to third bank note cassettes 16, 17 and 18 in this way, the bank notes in first and second bank note cassettes 16 and 17 are pressed downwards by presser plates 309a and 309b and held by flappers 315a and 315b, and thus are received into the lower parts and the depositing operation is completed.

Also, if non-approval is inputted in the state in which bank notes A have been stacked in depositing temporary stacking section 38, bank notes A in depositing temporary stacking section 38 will be returned to bank note receiving chamber 454, and then they will be returned to the user by opening door 8. When bank notes A have been taken out of bank note receiving chamber 454, door 8 will close.

FIGURE 5 shows the flow of bank notes in the dispensing operation.

First, a dispensing transaction is selected, and then the dispensing amount is input. Then, the bank notes A stored in each of first and second bank note cassettes 16 and 17 are pressed downwards by presser plates 309a and 309b, and flappers 315a and 315b are disengaged. Then, the dispensing preparation operation is executed by raising elevators 305a and 305b so that stored bank notes A are placed in contact with take out rollers 304a and 304b.

In this case, 10,000 yen notes are taken out from first bank note cassette 16 and 1,000 yen notes from second bank note cassette 17, one by one, by the rotation of take out rollers 304a and 304b. Then, the 10,000 yen notes and 1,000

yen notes are respectively counted and, at the same time, are transported horizontally forwards and guided to upper unit 14a, and are thus transported to discrimination unit 36. Bank notes A which are discriminated as correct in discrimination unit 36 are stacked in dispensing temporary stacking section 37 via first selector gate 39a, second selector gate 39b, third selector gate 39c and fourth selector gate 39d. When sufficient bank notes A have been dispensed, the taking out of bank notes A is stopped and the bank notes A stacked in dispensing temporary stacking section 37 are released into bank note receiving chamber 454 in a bundle. Then they are dispensed to the user by opening door 8. When the user has taken out bank notes A, the dispensing operation is completed by closing door 8.

Incidentally, bank notes A which are discriminated as unsuitable for dispensing (reject notes) by discrimination unit 36 are sent to lower unit 14b via first selector gate 39a. Then, as shown by the broken line in FIGURE 5, they are sent to stacking section 18a of third bank note cassette 18 via eleventh, sixth, ninth and tenth selector gates 39k, 39f, 39i and 39j, and are stacked there.

Next, the flow of bank notes in the depositing return operation is described with reference to FIGURE 6.

In the depositing operation, if a cancellation is input from for instance CRT display unit 9 after bank notes A have been stacked in depositing temporary stacking section 38, bank notes A are released to bank note receiving chamber 454 in a bundle. After this, these bank notes A are returned to the user by opening door 8.

FIGURE 7 shows the flow of bank notes in the forgotten

bank notes recovery operation.

In the case of the user not picking up paid out bank notes A even after a specified time has elapsed with door 8 in the open state, first, door 8 is closed. Then, bank notes A are taken in one by one, and the bank notes A which have thus been taken in are recovered into recovery box 18b of third bank note cassette 18 via discrimination unit 36, first selector gate 39a, eleventh selector gate 39k, sixth selector gate 39f, ninth selector gate 39i and tenth selector gate 39j.

Next, the flow of bank notes in the bank note loading (replenishment) operation is described with reference to FIGURE 8.

For instance, when a member of the staff selects the bank note loading mode when bank notes A for loading are set in fourth bank note cassette (loading note cassette) 19, the loading operation of bank notes A is commenced.

Bank notes A are taken one by one from fourth bank note cassette 19 by take out roller 304d. They are transported via second selector gate 39b, third selector gate 39c and fifth selector gate 39e and guided to discrimination unit 36, where the denominations of notes are discriminated. After discriminating by discrimination unit 36, bank notes A are transported downwards from first selector gate 39a and then via eleventh selector gate 39k and sixth selector gate 39f. In this case, the direction of all 1,000 yen notes is changed at seventh selector gate 39g, and they are stacked in stacking section 301b of second bank note cassette 17. 10,000 yen notes are transported via seventh selector gate 39g and their direction is changed at eighth selector gate

39h. They are then stacked in stacking section 301a of first bank note cassette 16. Both types of notes are stored by being pressed into receivers 20 and 21.

Also, any bank notes A which are discriminated by discrimination unit 36 during loading as notes which should be rejected are diverted upwards at first selector gate 39a, and are stacked in dispensing temporary stacking section 37 via second selector gate 39b and third selector gate 39c. At this time, the notes taken out from fourth bank note cassette 19 and passed through second selector gate 39b (loading notes) and the rejected notes are overlaid on convey path R4 between second selector gate 39b and third selector gate 39c. For this reason, either the taking out is momentarily stopped when a reject note has been identified, and then restarted after the reject note has passed along convey path R4, or the taken out notes (loading notes) and the reject notes in the overlaid state are transported and the reject notes are stacked together with the overlaid loading notes in dispensing temporary stacking section 37. Then, when bank notes A in fourth bank note cassette 19 are exhausted, the loading ceases.

When reject notes have occurred, as shown in FIGURE 9, the reject notes are transported from dispensing temporary stacking section 37 to bank note receiving chamber 454 and are taken in one by one by intake roller 403. After they have been re-discriminated at discrimination unit 36, the notes which have been discriminated by type are guided to lower unit 14b from first selector gate 39a and received in the respective bank note cassette 16 and 17 for the note denominations.

Also, the re-rejected bank notes are guided upwards from first selector gate 39a, their direction is changed by second selector gate 39b, and they are received in the empty fourth bank note cassette 19.

In the above embodiment, in the loading operation, the loading of bank notes A from fourth bank note cassette 19 only has been described, but loading can also be carried out by setting bank notes for loading in bank note stacker 22 of third bank note cassette 18.

Next, the flow of bank notes in the strict checking operation is described with reference to FIGURE 10.

Bank notes A taken out from first bank note cassette 16 and second bank note cassette 17 are transported to upper unit 14a and discriminated by discrimination unit 36. Then, the direction of the notes is changed at first selector gate 39a and second selector gate 39b and they are stored in fourth bank note cassette 19.

When reject notes, such as notes which cannot be discriminated, occur in discrimination unit 36, these are transported downwards from first selector gate 39a and are stacked in stacking section 18a of third bank note cassette 18 via eleventh selector gate 39k, sixth selector gate 39f, nineth selector gate 39i and tenth selector gate 39j.

The case of using first bank note cassette 16 as the 10,000 yen note cassette, second bank note cassette 17 as the 1,000 yen note cassette, bank note stacker 22 of third bank note cassette 18 as the depositing bank note cassette and fourth bank note cassette 19 as the loading bank note cassette has been described. However, it is also possible to use first bank note cassette 16 as the 1,000 yen note

cassette or as a bank note cassette which stores notes other than the above denominations, and also, to use second bank note cassette 17 as the 10,000 yen note cassette or as a bank note cassette which stores notes other than the above denominations. Moreover, particularly in cases such as the holiday operation of depositing/dispensing apparatus 1, by storing bank notes for dispensing use or replenishment use in bank note stacker 22 of third bank note cassette 18 and in fourth bank note cassette 19, it is also possible to use these bank note cassettes 18 and 19 as dispensing bank note cassettes.

Next, the construction of auxiliary bank note cassette unit 900 is described with reference to FIGURE 2.

Auxiliary bank note cassette unit 900 is composed of such items as hopper 910 for the staff to load bank notes into from the rear, discrimination unit 920 which discriminates the bank notes, reject note stacker 930 which stacks bank notes which have been discriminated as unsuitable for dispensing (reject notes) by discrimination unit 920, auxiliary bank note cassette 940 which stores bank notes which have been discriminated as suitable for dispensing, operating panel 950 for operation by staff, power source 960 for driving auxiliary bank note cassette unit 900, and auxiliary bank note cassette unit controller 970.

Hopper 910 is composed of intake roller 911, feed roller 912, gate roller 913, and back-up mechanism 914 which moves up and down and presses bank notes against rollers 911, 912 and 913. It is designed to separate bank notes one at a time from the bottom of a bundle of, for instance, 100

bank notes and supply them to convey path r1. This hopper 910 has a door 915, and door 915 is provided with a lock 916. Consequently, when setting bank notes in hopper 910, this is carried out with lock 916 unlocked and door 915 open. Also, the design is such that, by closing door 915 and locking lock 916, if bank notes are left in hopper 910, hopper 910 can be used as a bank note cassette type of safe. By this means, if door 915 is closed and lock 916 is locked after bank notes have been set in hopper 910, it is safe for the staff to remove auxiliary bank note cassette unit 900 from depositing/dispensing apparatus 1 before the taking in of the bank notes which have been set in hopper 910 is completed.

Discrimination unit 920 discriminates whether or not bank notes which are transported to it by convey path r1 are suitable for dispensing from, for instance, their thickness and shape. In this case, since the setting of bank notes in hopper 910 is carried out by staff and thus few bank notes unsuitable for dispensing, such as counterfeit notes and damaged notes, will be set, it is possible to make the factor for discrimination a minimum.

Reject note stacker 930 is composed of selector gate 931 which diverts those notes transported to it by convey path R2 unsuitable for dispensing, such as counterfeit notes and damaged notes and notes which have been discriminated as undiscriminatable (reject notes), and stacking box 932 which stacks the reject notes diverted by selector gate 931. Similar to hopper 910, reject note stacker 930 has a door 933, and this door 933 is provided with a lock 934. Consequently, the design is such that, when the bank notes

have been taken in from hopper 910, by opening door 933, staff can reset the reject notes in hopper 910 and return them to the accountancy. Also, with door 933 closed and lock 934 locked, it is designed to be used as a safe, and the reject notes can safely be kept in it.

Auxiliary bank note cassette 940 is of the same construction as bank note cassettes 16, 17 and 19 in depositing/dispensing unit 12, and is designed to be installed and removed from the rear of auxiliary bank note cassette unit 900. Also, accumulator/extractor device 941 is provided in auxiliary bank note cassette 940, and flappers 943 are provided to form a stacking section 942 in which it is possible to stack, for instance, 100 bank notes. Accumulator/extractor device 941 is composed of take out roller 944, elevator 945 and presser plate 946. As described later, auxiliary bank note cassette 940 can be used in such ways as for temporary storage of bank notes when replenishing bank notes in bank note cassettes 16 and 17 of depositing/dispensing unit 12, or for increasing bank note storage capacity by using it for storing 1 type of bank note, for instance as a second 10,000 yen note cassette (or 1,000 yen note cassette).

Bank note carry out port ra is formed in auxiliary bank note cassette unit 900 to correspond to bank note intake port Ra of lower unit 14b. It is designed so that bank notes can be transported to depositing/dispensing unit 12, and, at the same time, selector gate 901, whose drive source is a rotary solenoid (not shown), is arranged at the branch point between bank note carry out port ra and auxiliary bank note cassette 940. Furthermore, the construction inside

auxiliary bank note cassette unit 900 is such that bank note passage detectors and bank note presence detectors 903, composed of light-emitting elements and light-receiving elements, are arranged in various positions.

Also, power source 960 and auxiliary bank note cassette unit controller 970 are mounted in auxiliary bank note cassette unit 900 and the unit is designed so that it can be separated from depositing/dispensing unit 12 and can operate by itself. When setting bank notes in, for instance, bank note cassette 16 of depositing/dispensing unit 12, bank note cassette 16 can be installed in place of auxiliary bank note cassette 940 of auxiliary bank note cassette unit 900. In that state, since auxiliary bank note cassette unit 900 can operate independently, it is possible to load and replenish bank notes in bank note cassette 16.

FIGURE 11 shows the installation of depositing/dispensing unit 12 and auxiliary bank note cassette unit 900 in cabinet 2.

Upper unit 14a of depositing/dispensing unit 12 is secured by slide-rail a, while lower unit 14b is secured by slide-rail b, and each of these rails is fixed to the inside of cabinet 2 and to internal wall 2c of cabinet 2. Also, gap d is maintained between upper unit 14a and lower unit 14b. Rollers 61 are mounted in the bottom of upper unit 14a and the design is such that, by being in rolling contact with the top of lower unit 14b, rollers 61 maintain gap d so that gap d is not reduced. Incidentally, G denotes a vertical linking gear, and this transmits the drive of the drive motor (not shown), provided in lower unit 14b, to upper unit 14a so that the driving operation of the

transport apparatus can be carried out.

In this way, the design is such that, since upper unit 14a and lower unit 14b are held by slide rails a and b, they can be drawn out from cabinet 2 either forwards or backwards as required. As shown in FIGUREs 1 and 11, cabinet 2 is provided with doors 2a and 2b at the front and back respectively which can be opened and closed, and the design is that, by these means, units 14a and 14b can be withdrawn either forwards or backwards.

At the same time, the design is that auxiliary bank note cassette unit 900 can be housed in the space behind units 14a and 14b. In this case, auxiliary bank note cassette unit 900 is not secured to cabinet 2 by slide-rail a or slide-rail b, as in the cases of upper unit 14a and lower unit 14b. It is designed to be able to be shifted freely by, for instance, castors 902, and it can be used simply as an independent unit. Consequently, in automated corners of banks and the like where a number of depositing/dispensing apparatus 1 are lined up, the loading and replenishment of bank notes to a number of depositing/dispensing apparatus 1 by 1 auxiliary bank note cassette unit 900 is made possible by connecting auxiliary bank note cassette unit 900 in sequence.

FIGURE 12 shows operating panel 950 of auxiliary bank note cassette unit 900. The following are provided on operating panel 950, intake start switch 951, which commands the commencement of the intake of bank notes which have been set in hopper 910, check switch 952, which is operated when a check is carried out at the completion of bank note intake as to whether the total of the number of bank notes taken in

added to the number of reject notes agrees with the number of bank notes which were set in hopper 910, reset switch 953 for resetting the number of notes counted to that at the time of stoppage of bank note intake due to a jam or the like, selector switch 954 for selecting operation by connecting auxiliary bank note cassette unit 900 on-line with depositing/dispensing unit 12, or independent operation, display unit 955, which displays the number of bank notes taken in, using, for instance, a 7-segment display, by the operation of check switch 952, and display 956, which warns of the occurrence of jams.

FIGURE 13 shows a block diagram of one embodiment of the invention. Main controller 150 controls the whole of depositing/dispensing apparatus 1, and the following are connected to main controller 150: depositing/dispensing unit controller 151, memory unit 152, operating panel and internal monitoring unit controller 153, card and slip processing controller 154, discrimination controller 155, passbook reading and printing controller 156, communication controller 158, and remote monitor input/output controller 159.

Memory unit 152 is composed of, for instance, a ROM (Read Only Memory), and is designed to store the control programs.

Monitor controller 155 controls discrimination unit 36. Operating panel and internal monitoring unit controller 153 controls operating panel 3 and internal monitor 13.

Card and slip processing controller 154 controls card/receipt processing unit 11.

Passbook reading and printing controller 156 executes

control of the reading of the magnetic stripes of passbooks inserted from passbook insertion port 4 and, at the same time, of passbook reading and printing unit 157 which stores the details of the passbooks and the transaction journal.

Depositing/dispensing unit controller 151 controls depositing/dispensing unit 12 in response to signals from main controller 150 and signals from discrimination unit 36. Also, it is possible to connect auxiliary bank note cassette unit controller 970, which controls auxiliary bank note cassette unit 900, to depositing/dispensing unit controller 151.

Main controller 150 manages the bank notes by counting the numbers of bank notes stored in each stacker 20, 21, 22 and 23 in response to signals from each detector in depositing/dispensing unit 12 which are obtained via depositing/dispensing unit controller 151 and signals from discrimination unit 36 which are obtained via monitor controller 155, counting the number of bank notes stored in auxiliary bank note cassette 940 in response to signals from the various sensors in auxiliary bank note cassette unit 900 which are obtained via auxiliary bank note cassette unit apparatus controller 970, counting, denomination by denomination, the numbers of note stored, the numbers of notes loaded and the numbers of notes strictly checked, and, at the same time, recording these various totals in a RAM to be described later. Also, main controller 150 controls remote monitoring unit 175, which is provided in a position separate from depositing/dispensing apparatus 1, using remote monitor input/output controller 159. Furthermore, main controller 150 is designed to execute data transmission

with a central processing unit (not shown), using communication controller 158.

Auxiliary bank note cassette unit controller 970 usually, when auxiliary bank note cassette unit 900 is operating independently, controls auxiliary bank note cassette unit 900 in response to signals from a discrimination controller (not shown) which controls, for instance, discrimination unit 920. Also, when auxiliary bank note cassette unit 900 is connected to depositing/dispensing unit 12, controller 970 controls auxiliary bank note cassette unit 900 in response to signals from, for instance, depositing/dispensing unit controller 151 and signals from the discrimination controller which controls discrimination unit 920.

FIGURE 14, taking as an example the case when auxiliary bank note cassette unit 900 is connected to depositing/dispensing unit 12, is a block diagram showing the compositions of depositing/dispensing unit controller 151 and auxiliary bank note cassette unit controller 970.

Depositing/dispensing mechanism controller 151 is obtained by connecting the following to CPU (Central Processing Unit) 152a, which controls the whole; ROM (Read Only Memory) 151b, which stores the control programs; RAM (Random Access Memory) 151c, which controls the existing value of the bank notes in each bank note cassette 16, 17, 18 and 19, denomination by denomination; interface 151d, which enables data communication with main controller 150; interface 151e, which enables data communication with auxiliary bank note cassette unit controller 970; input/output port 151f; and interface 151g, which enables

data communication with monitor controller 155.

Bank note passage detectors 40a-40w and bank note presence detectors 41a-41d and 457 are connected to input port 151fa of input/output port 151f, and the detection signals from these detectors are supplied to it.

The following are respectively connected to output port 151fb of input/output port 151f: transport driver 151h, which drives the transport apparatus of bank note convey paths R and selector gates 39a-39l; driver 151i, which drives bank note intake/out-dispensing apparatus 15 of depositing/dispensing port 7; and, bank note cassette driver 151j, which drives accumulator/extractor devices 24, 25, 26 and 27 of bank note cassettes 16, 17, 18 and 19.

On the other hand, auxiliary bank note cassette unit controller 970 is obtained by connecting the following to CPU 970a, which controls the whole; ROM 970b, which stores the control programs; RAM 970c, which controls the existing value of bank notes in auxiliary bank note cassette 940; interface 970e, which enables data communication with depositing/dispensing unit controller 151; input/output port 970f; and interface 970g, which enables data communication with the discrimination controller (not shown) which controls discrimination unit 920.

Bank note passage detectors and presence detectors 903 are connected to input port 970fa of input/output port 970f, and the design is that the detection signals from these detectors are supplied to it.

The following are respectively connected to output port 970fb of input/output port 970f: conveying driver 970h, which drives the transport apparatus of bank note convey

paths r1 and r2 and selector gates 901 and 931; driver 970i, which drives rollers 911, 912 and 913 and back-up mechanism 914 of hopper 910; and bank note cassette driver 970j, which drives accumulator/extractor device 941 of auxiliary bank note cassette 940.

FIGURE 15 shows an example of the composition of the memory areas in RAM 151c of depositing/dispensing unit controller 151. Such areas are provided as, for instance: a total memory area which stores, for instance, the numbers of deposited bank notes, the number of replenishment bank notes, the number of loaded bank notes, the number of dispensed bank notes, the number of partial recovery bank notes and the number of strictly checked bank notes, denomination by denomination, a current value memory area which stores the numbers of bank notes stacked in each of bank note cassettes 16, 17, 18 and 19 of depositing/dispensing unit 12 and the numbers of bank notes (including reject notes), denomination by denomination, existing in depositing/dispensing unit 12, a relevant transaction memory area which stores the numbers of bank notes, denominatin by denomination, used in depositing, replenishment, loading, dispensing and partial recovery, transaction by transaction, an auxiliary bank note cassette memory area which stores the denomination and number of bank notes stacked in auxiliary bank note cassette 940, and a specified value memory area which stores primary near end, secondary near end and the maximum payable bank notes, denomination by denomination.

The design is such that, by setting selector switch 954 to "Connect", the data (the existing value of bank notes

stacked in auxiliary bank note cassette 940) stored in the auxiliary bank note cassette memory area is added to the data (the value of the bank notes in the bank note cassettes in depositing/dispensing unit 12 which agrees with the denominations) in the current value memory area, and can be controlled by depositing/dispensing unit 12.

Next, an example of the holiday operation of depositing/dispensing apparatus 1, when auxiliary bank note cassette unit 900 of the above construction is connected to depositing/dispensing unit 12, is explained with reference to FIGURE 16. In the case of holiday operation, first bank note cassette (10,000 yen note cassette) 16 and second bank note cassette (1,000 yen note cassette) 17 are in the state in which they are filled with 10,000 yen notes and 1,000 yen notes respectively. Moreover, since the number of 10,000 yen notes typically paid out is vastly greater than 1,000 yen notes, for instance, bank note stacker 22 of third bank note cassette 18, fourth bank note cassette (loading note cassette) 19, hopper 910 of auxiliary bank note cassette unit 900 and auxiliary bank note cassette 940 are also left filled with 10,000 yen notes.

Then, if the dispensing process is selected during holiday operation, in the same way as in the dispensing process shown in FIGURE 5, 10,000 yen notes are taken out from first bank note cassette 16 and 1,000 yen notes from 1,000 yen note cassette 17 respectively, one by one, and are respectively guided from lower unit 14b to upper unit 14a. Bank notes which are discriminated as correct by discrimination unit 36 are stacked in dispensing temporary stacking section 37 via first, second, third and fourth

selector gates 39a, 39b, 39c and 39d. Then, bank notes for dispensing corresponding to the requested amount are paid to the user from depositing/dispensing port 7 via bank note receiving chamber 454.

Incidentally, bank notes which are determined as unsuitable for dispensing by discrimination unit 36 are, similarly, sent to stacking section 18a of third bank note cassette 18 via first, eleventh, sixth, ninth and tenth selector gates 39a, 39k, 39f, 39i and 39j, and are stacked there.

Also, if the depositing process is selected during holiday operation, in the same way as in the depositing process shown in FIGURES 3 and 4, bank notes inserted by the user into bank note receiving chamber 454 are taken in, one by one, and are discriminated by discrimination unit 36. Then bank notes discriminated as having fronts uppermost are conveyed to and stacked in depositing temporary stacking section 38 by first, second, third and fourth selector gates 39a, 39b, 39c and 39d. Also, bank notes discriminated as having backs uppermost are conveyed to depositing temporary stacking section 38 via first, second, third and fifth selector gates 39a, 39b, 39c and 39e, and they are reversed and stacked there.

In this state, by the user inputting confirmation, the bank notes in depositing temporary stacking section 38 are once more taken in via bank note receiving chamber 454. As the result of having been discriminated by discrimination unit 36, 10,000 yen notes are stacked in stacking section 301a of bank note cassette 16 via selector gates 39k, 39f and 39g, and 1,000 yen notes are stacked in stacking section

301b of bank note cassette 17 via selector gate 39g.

Also, 10,000 yen and 1,000 yen notes of the old type, and 5,000 yen notes are stacked in stacking section 18a of bank note cassette 18 via selector gates 39f, 39i and 39j.

At the same time, when bank notes are discriminated by discrimination unit 36 as being notes which should be rejected, the discriminated reject notes are stacked in dispensing temporary stacking section 37 via selector gates 39a, 39b, 39c and 39d. They are then returned to the user from bank note receiving chamber 454.

Also, if non-approval is input by the user regarding the bank notes have been stacked in depositing temporary stacking section 38, as shown in FIGURE 6, the bank notes in depositing temporary stacking section 38 are returned to the user via bank note receiving chamber 454.

Furthermore, bank notes which have not been picked up by the user are taken in from bank note receiving chamber 454, and recovered into recovery box 18b of bank note cassette 18, as shown in FIGURE 7.

In the above design, if, for instance, first bank note cassette 16 becomes empty of 10,000 yen notes (end state) while carrying out the dispensing process, dispensing of 10,000 yen notes from bank note stacker 22 of third bank note cassette 18 is executed. As shown in FIGURE 17, 10,000 yen notes taken out from bank note stacker 22 are guided to upper unit 14a via selector gates 39k, 39f, 39g and 39h. Then, after bank notes which have been discriminated as correct by discrimination unit 36 have been stacked in dispensing temporary stacking section 37 via selector gates 39a, 39b, 39c and 39d, bank notes corresponding to the

dispensing amount are paid to the user from depositing/dispensing port 7 via bank note receiving chamber 454.

Also, any reject notes are controlled so that they are not overlaid on the above bank notes for dispensing, and are stacked in stacking section 18a of bank note cassette via selector gates 39a, 39k, 39f, 39i and 39j.

On the other hand, when depositing/dispensing unit 12 has begun to carry out dispensing of 10,000 yen notes from bank note stacker 22 of third bank note cassette 18, in the intervals between that dispensing processing, replenishment of 10,000 yen notes to first bank note cassette 16 from fourth bank note cassette 19 is executed. As shown in FIGURE 18, 10,000 yen notes are taken out one by one from fourth bank note cassette 19 and are guided to discrimination unit 36 via selector gates 39b, 39c and 39e. Then, after 10,000 yen notes which have been discriminated as suitable for dispensing have been stacked in stacking section 301a of first bank note cassette 16 via selector gates 39a, 39k, 39f, 39g and 39h, they are pressed into, and stacked in, bank note receiver 20.

Also, any reject notes are controlled so that they are not overlaid on the above bank notes for dispensing, and are stacked in dispensing temporary stacking section 37 via selector gates 39a, 39b, 39c and 39d. Then, after the replenishment process has been completed, they are transported from dispensing temporary stacking section 37 to bank note receiving chamber 454 and, after they have been discriminated again by discrimination unit 36, any note whose denomination has been discriminated is received into

first bank note cassette 16 by the above means.

Moreover, any notes which have been re-rejected are, for instance, stacked in stacking section 18a of third bank note cassette 18 via selector gates 39a, 39k, 39f 39i and 39j.

In addition, the design is such that, in the case of second bank note cassette 17 being empty of 1,000 yen notes (end state), the dispensing of 1,000 yen notes cannot be carried out from depositing/dispensing apparatus 1.

In this way, the replenishment of 10,000 yen notes from fourth bank note cassette 19 to first bank note cassette 16 has been completed and bank note cassette 16 has become full of 10,000 yen notes. If bank note stacker 22 of third bank note cassette 18 is empty, dispensing of bank notes is carried out from first bank note cassette 16 in the manner stated above.

On the other hand, if fourth bank note cassette 19 becomes empty or in the primary or secondary near end state (almost empty) with few bank notes remaining due to replenishment of 10,000 yen notes from fourth bank note cassette 19 to first bank note cassette 16, replenishment of 10,000 yen notes from auxiliary bank note cassette 940 of auxiliary bank note cassette unit 900 to fourth bank note cassette 19 is executed. As shown in FIGURE 19, 10,000 yen notes in auxiliary bank note cassette 940 are taken out one by one by take out roller 944, and are guided into lower unit 14b of depositing/dispensing unit 12 from intake port Ra via selector gate 901 and bank note carry out port ra. The bank notes which have been guided into lower unit 14b are, for instance, sent to discrimination unit 36 via

selector gates 39kn 39a, 39c and 39e.

Then, ensuring that they are not overlaid on bank notes coming from auxiliary bank note cassette 940, after the 10,000 yen notes which have been discriminated as suitable for dispensing by discrimination unit 36 have been stacked in stacking section 301d of fourth bank note cassette 19 by selector gates 39a and 39b, they are pressed into, and stacked in, bank note stacker 23.

Any notes which have been rejected by discrimination unit 36 are, for instance, stacked in stacking section 18a of third bank note cassette 18 via selector gates 39a, 39k, 39f 39i and 39j.

When the amount of 10,000 yen notes stored in auxiliary bank note cassette 940 becomes few due to the replenishment of 10,000 yen notes from auxiliary bank note cassette 940 to fourth bank note cassette 19, the 10,000 yen notes which have been set in hopper 910 are taken out and are stacked in auxiliary bank note cassette 940. As shown in FIGURE 20, the 10,000 yen notes which have been set in hopper 910 are extracted one by one by intake roller 911, etc, and are sent to discrimination unit 920 via convey path r1. Then, after the 10,000 yen notes whose denomination has been discriminated by discrimination unit 920 have been stacked in stacking section 942 of auxiliary bank note cassette 940 via convey path r2 and selector gates 931 and 901, they are pressed downward by flapper 943 and are stacked.

Also, as shown in FIGURE 21, any notes which have been rejected by discrimination unit 920 are sent to reject note stacker 930 via selector gate 931 and are stacked there.

In this way, 10,000 yen notes stacked in auxiliary bank

note cassette 940, as described above, are taken out from first bank note cassette 16 and paid to the user, after being sent to first bank note cassette 16 via fourth bank note cassette 19. In this embodiment, first, 10,000 yen notes are paid out from first bank note cassette 16, and when the 10,000 yen notes in first bank note cassette 16 are exhausted, dispensing is carried out from bank note stacker 22 of third bank note cassette 18. Also, the design is that the 10,000 yen notes in fourth bank note cassette 19 are supplied to the empty first bank note cassette 16, and then the 10,000 yen notes from auxiliary bank note cassette 940 of auxiliary bank note cassette unit 900 are supplied to fourth bank note cassette 19 while, at the same time, the 10,000 yen notes in hopper 910 are supplied to auxiliary bank note cassette 940. Thus, the design is that, by repeating the operation of dispensing from first bank note cassette 16, the operation of replenishing first bank note cassette 16 from fourth bank note cassette 19 and the operation of replenishing fourth bank note cassette 19 from auxiliary bank note cassette 940, all the respective 10,000 yen notes in first bank note cassette 16, bank note stacker 22 of third bank note cassette 18, fourth bank note cassette 19 and hopper 910 and auxiliary bank note cassette 940 of auxiliary bank note cassette unit 900 will be paid out. Consequently, it becomes possible to pay out a large number of bank notes from depositing/dispensing apparatus 1.

In addition, the transfer of bank notes from bank note cassette to bank note cassette (replenishment) is carried out while of waiting for customers in order not to prevent either the dispensing or depositing processing of bank

notes. In particular, the design is such that, when replenishing a bank note cassette in depositing/dispensing unit 12 with the bank notes in auxiliary bank note cassette 940, the operation is under the control of depositing/dispensing unit controller 151.

As described above, the storage capacity of bank notes can be simply increased in order that the bank notes available for dispensing are not insufficient. Consequently, even in the cases of unmanned depositing/dispensing apparatus or of holiday operation, it becomes possible to solve the disadvantage of bank notes available for dispensing becoming insufficient, or worse, of becoming unable to operate the depositing/dispensing apparatus within a short period.

Also, because the automatic replenishment of the bank note cassette in the depositing/dispensing apparatus by independent operation becomes possible, since the auxiliary bank note cassette unit can also be operated independently, a reduction of the time taken by loading of bank notes can be planned.

Incidentally, in the above embodiment, the case has been explained of making first bank note cassette 16 as 10,000 yen note cassette and second bank note cassette 17 as 1,000 yen note cassette, and replenishing only first bank note cassette 16 with 10,000 yen notes. However, this invention is not limited to this. For instance, it can also be adapted to such uses as making first and second bank note cassettes 16 and 17 as 10,000 yen note cassettes, and replenishing these bank note cassettes 16 and 17 with 10,000 yen notes, or making first and second bank note

cassettes 16 and 17 as 1,000 yen note cassettes and replenishing these bank note cassettes 16 and 17 with 1,000 yen notes, or, again, making it possible to handle 5,000 yen notes.

Also, in the above embodiment, a money-safe type method of use was adopted for auxiliary bank note cassette unit 900, in which it temporarily stores bank notes when replenishing bank note cassette 19 is in depositing/dispensing unit 12. However, it can also be used in the following way. As shown in FIGURE 22, it is also possible to re-supply bank notes, which have been discriminated for denomination by discrimination unit 920 and are stacked in auxiliary bank note cassette 940, to first bank note cassette 16 (or second bank note cassette 17 or bank note stacker 22 of third bank note cassette 18) in depositing/dispensing unit 12, without their being stacked in fourth bank note cassette 19 via discrimination unit 36.

Moreover, as shown in FIGURE 23, it is possible to pay bank notes, which have been discriminated for denomination by discrimination unit 920 and are stacked in auxiliary bank note cassette 940, to the user from depositing/dispensing port 7 via bank note receiving chamber 454 by, for instance, sending them to dispensing temporary stacking section 37 via discrimination unit 36.

Furthermore, as shown in FIGURE 24, it is also possible to re-supply bank notes, which have been taken in from hopper 910, according to the results of their discrimination by discrimination unit 920, directly to first bank note cassette 16 (or second bank note cassette 17 or bank note stacker 22 of third bank note cassette 18, or fourth bank

note cassette 19) in depositing/dispensing unit 12. Also, it is possible to pay the bank notes, which have been taken in from hopper 910, to the user from depositing/dispensing port 7 via bank note receiving chamber 454 by, for instance, sending them to dispensing temporary stacking section 37 via discrimination unit 6.

CLAIMS

1. An automatic transaction apparatus comprising:  
a main body including a cabinet having an outlet port through which bank notes are dispensed;  
means in the cabinet for storing bank notes;  
first conveying means in the cabinet for conveying bank notes from the storing means to the outlet port;  
second conveying means in the cabinet for conveying bank notes to the storing means; and an auxiliary unit adapted for use with the main body and including means operatively connectable to the second conveying means for supplying bank notes to the second conveying means.
2. The apparatus of claim 1 wherein the auxiliary unit includes a cassette for storing bank notes.
3. The apparatus of claim 1 or 2 wherein the auxiliary unit includes a hopper for receiving bank notes.
4. The apparatus of claim 4 wherein the auxiliary unit includes first transporting means for transporting bank notes from the hopper to the cassette.
5. The apparatus of claim 4 wherein the auxiliary unit includes second transporting means for transporting

bank notes from the hopper to the second conveying means.

6. The apparatus of claim 4 or 5 wherein the auxiliary unit includes means for discriminating whether the bank notes are suitable for dispensing through the outlet port of the main body, and the bank notes which are found to be suitable are either transported to the cassette by the first transporting means or transported to the second conveying means by the second transporting means.

7. The apparatus of any preceding claim further comprising means for determining whether the main body and the auxiliary unit are operatively connected.

8. Apparatus as claimed in any preceding claim in which the main body includes first memory means for memorising first data corresponding to the amount of bank notes stored in the storing means; the auxiliary unit includes second memory means for memorising second data corresponding to the amount of bank notes stored in the auxiliary unit and means in the main body for adding the first data and the second data when the auxiliary unit is operatively connected to the main body.

9. Apparatus as claimed in any preceding claim wherein the main body includes means for detecting when no bank notes are present in the storing means in the main body

and to generate a signal when such a condition arises, and where in response to said signal bank notes are caused to be conveyed from the auxiliary unit to the main body.

10. An automatic bank note depositing/dispensing apparatus substantially as herein before described with reference to the accompanying drawings.

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